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		Melissa@epa.gov	·						
	Alternate								
	Taylor Mac	y, (202)343-9183,	Macy.Taylor@epa.	gov					
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NAME OF OFFEROR OR CONTRACTOR

EM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
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	Funded: \$15,000.00				

#### ATTACHEMENT A

Statement of Work

Title: Supplemental Monitoring Studies at CASTNET Sites in Support of

the NOx/SOx Secondary Standard

**Contract #:** EP-W-16-015

**Project #:** 2010

**Period of Performance:** 7/9/2018 to 7/8/2019

**EPA Key Personnel** 

# Task Order Project Officer (TOPO)/Contract Level Project Officer (PO):

Melissa Puchalski Clean Air Markets Division (OAP/OAR/CAMD) 1200 Pennsylvania Ave., NW Mail Code 6204M

Washington, DC 20460 *phone:* (202) 343-9882

email: puchalski.melissa@epa.gov

#### **Alternate TOPO:**

Taylor Macy Clean Air Markets Division (OAP/OAR/CAMD) 1200 Pennsylvania Ave., NW Mail Code 6204M Washington, DC 20460 phone: (202) 343-9183

email: macy.taylor@epa.gov

# **Contracting Officer (CO):**

Michael Fox Contracting Officer

Administrative Contract Service Center

1200 Pennsylvania Ave N.W.

Mail Code 3803R

Washington DC 20460 *phone:* (202) 564-2550

email: fox.michael@epa.gov

#### STATEMENT OF WORK

#### I. INTRODUCTION

The Clean Air Status and Trends Network (CASTNET) is a long-term environmental monitoring network that measures changes in ambient air quality and assesses atmospheric deposition over broad geographic regions of the U.S. (<a href="https://www.epa.gov/castnet">https://www.epa.gov/castnet</a>). Operating since 1987, CASTNET has evolved into a robust regional monitoring program which currently consists of approximately 95 monitoring stations nationwide. The Environmental Protection Agency (EPA) coordinates the operation of the network in cooperation with numerous federal, tribal, state and local partners.

The primary monitoring objectives of CASTNET are to:

- Provide high quality data on atmospheric deposition, rural ground level ozone and other forms of atmospheric pollution;
- Support the primary and secondary ozone NAAQS and provide data on NAAQS compliance in rural
  areas;
- Monitor the status and trends in regional air quality and atmospheric deposition;
- Assess and report on geographic patterns and long-term, temporal trends in ambient air pollution and atmospheric deposition;
- Improve our understanding of PM and ozone formation;
- Validate and improve atmospheric models;
- Provide data for health-based research and epidemiology studies;
- Assess the effectiveness of EPA's emission reduction programs; and
- Support science and ecosystem studies.

CASTNET sites measure weekly average concentrations of sulfate (SO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>), sulfur dioxide (SO<sub>2</sub>), nitric acid (HNO<sub>3</sub>), chloride (Cl<sup>-</sup>) and the base cations (Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>and Ca<sup>2+</sup>) using a 3-stage filter pack. In addition, each site may make ancillary measurements, including hourly ozone (O<sub>3</sub>), hourly meteorology, ammonia (NH<sub>3</sub>) gas using passive devices, and trace-level gases. Trace-level gas monitors include reactive oxidized nitrogen (NOy), nitric oxide (NO), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO). CASTNET O<sub>3</sub>, meteorological, and trace gas measurements follow the requirements in the Code of Federal Regulations (CFR) and EPA's Quality Assurance Handbook.

### II. PURPOSE

The primary purpose of this task order is to improve the science and understanding of deposition process within the atmosphere. The EPA is currently evaluating the secondary National Ambient Air Quality Standard (NAAQS) for NOx and SOx. The work under this task will enhance the existing research currently available on direct deposition methods, atmospheric chemical processes that drive deposition parameters and estimates of sulfur and nitrogen loading to various landscapes. This research is a collaborative effort between EPA's Office of Air and Radiation (OAR), the Office of Research and Development (ORD), and other federal partners. This is a follow-on task order from the previous option periods.

Under this task order the contractor will continue to operate the enhanced NOy analyzer at the Duke Forest flux tower site located in North Carolina. The enhanced NOy analyzer will operate at the Duke Forest tower site through June 2019 as part of a larger reactive nitrogen flux study. Results from the enhanced NOy analyzer will be compared to the MARGA, CASTNET filter pack, and passive samplers.

Also under this task order, the contactor will continue collecting the site characterization dataset for 3 colocated CASTNET/AMoN sites. The dataset shall contain information about the soil and vegetation characteristics within 1km of each AMoN site. The contractor shall collect soil and vegetation samples at approximately 15 locations at each site for laboratory analysis. A bi-direction flux box model will be run using the site characterization information as input to calculate NH<sub>3</sub> fluxes at each site. The three sites where measurements shall be made are Bondville, IL (BVL130), Duke Forest, NC (DUK008), and Chiricahua National Monument, AZ (CHA467). Under the previous option period field sampling was completed for the fall, winter and spring seasons. Sampling under this task order will complete the summer sampling at each of the 3 sites. Under this task order work will continue on the data analysis and preparation for modeling NH<sub>3</sub> deposition.

#### III. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this task order are consistent with the activities authorized in CLIN 22 of the contract's Statement of Work.

#### IV. TECHNICAL DIRECTION

# 1. Prepare a Technical Proposal & Cost Estimate

The Contractor shall prepare a Task Order Proposal in accordance with the terms and conditions of contract clauses B.2 entitled Fixed Rates for Services – Indefinite delivery/Indefinite quantity contract.

# 2. Operate, Calibrate, and Quality Assure the Enhanced-NOy Measurement System

The Contractor shall continue operating the enhanced-NOy measurement system at the Duke Forest Flux Tower site (DUK008) which is co-located with a CASTNET filter pack. Operation includes routine calibrations, remote troubleshooting, QA, and data reporting. The operation of the standard NOy system and the CASTNET filter pack is covered under Task Order 2003 Base Program Operations. Hourly measurements from the enhanced NOy system include NHx, TNx, true NO<sub>2</sub>, NOy, NO, and HNO<sub>3</sub>. At the Duke Forest site, the enhanced NOy inlet is placed above the forest canopy on the 150ft tower.

Data from the enhanced NOy measurement system shall be delivered to CAMD daily with the routine CASTNET submittals. Quality assured data shall be submitted to CAMD monthly, 90 days after data collection.

Under this task the contractor shall also continue testing the converters for a configuration that provides the most reliable, accurate data as compared to the CASTNET filterpack, AMoN and MARGA system at Duke Forest. Further testing on the calibration system is also expected.

This task includes 4 repair trips for the enhanced NOy measurement system that shall only be used as necessary.

### 3. Ammonia Flux Site Characterization Database

The contractor installed measurement systems to collect soil moisture and temperature, 3D wind direction, and CASTNET meteorology at three CASTNET sites to develop a database of site characteristics for modeling the bi-directional flux of NH<sub>3</sub> under Task Orders 0010 and 1010. The contractor also visited each site to collect soil and vegetation samples for analysis. This task is a continuation of this work. The contractor shall complete the seasonal sampling – with one final site visit to Bondville to complete summer soil and vegetation sampling. Additionally, the contractor shall continue to collect hourly meteorological measurements and poll the data

remotely through July 2018. Meteorological measurements will be covered under Task Order 2003 Base Program.

After final sampling, the contractor shall provide EPA with a final data set that can be used to model deposition fluxes at the 3 monitoring sites. The final data set shall be documented and published on the EPA website. The contractor shall estimate labor hours for producing a final summary report on the field sampling campaign.

A description of the field measurements is included below. Only one final sampling campaign will take place under this task order.

Soil moisture and temperature sensors and sonic anemometers were installed under Task Order 0010. Sonic anemometer measurements of 3-dimensional wind (vectors u, v, w) and temperature shall be recorded at 10 Hertz. The contractor shall continue to run a post-processing package to perform data filtering, coordinate rotations, calculations of 30 minute or hourly turbulence statistics and apply QA metrics from the sonic anemometer.

Hourly data shall be stored in Oracle and submitted to CAMD daily. Quality assured results shall be submitted 90 days after measurements are recorded or analyzed.

This task also includes removing the soil moisture meter, meteorological equipment and data loggers once the study is over. The contractor may request that the site operators or calibrators remove the equipment if appropriate.

EPA has provided the contractor with sampling locations within a 1-km radius of each site. The locations were selected based on soil and vegetation type as reported in national online databases. The contractor shall use the sample locations as a guide when collecting the soil and vegetation samples, keeping in mind that the goal is to collect the dominate species and/or soil type.

Sample measurements and schedules are included in Table 1. The measurements are labeled to indicate if the contractor shall be responsible for the cost of the measurement. A brief description of the measurements that the contractor will be collecting is found below.

Approximately 30 composite soil samples will be collected from 15 locations and analyzed at the BVL130 site. At each of the 15 locations, 5 soil cores will be collected with a 1-m by 1-m plot. The sample depth will capture the organic (O), topsoil (A), and subsoil (B) horizons. Individual cores shall be separated into the three horizons and the five replicate samples shall be composited by horizon and measurement location generation a total of 15 O-horizon and 15 A-horizon samples per pilot site per season. Soil shall be immediately stored under refrigeration and extracted within 72 hours. Samples shall be analyzed for extractable NH<sub>4</sub><sup>+</sup> and pH. For the NH<sub>4</sub><sup>+</sup> analysis, five grams of field moist soil shall be extracted in 20 g of 0.01 molar CaCl<sub>2</sub> following standard protocols. Samples shall be analyzed by ion chromatography (IC) or colorimetry by the chosen laboratory. Direct determination of pH shall be performed on a 1:5 fresh soil/water slurry. Soil gravimetric moisture shall be determined by weight loss after heating 25 g of soil for 24 hours at 105 degrees Celsius (C).

Leaf litter shall be collected on the soil surface in the sample 15 locations as the soil samples were taken. Leaf litter, where available, shall be collected seasonally. Approximately 50 g of leaf litter shall be collected within the 1x1m soil sampling location.

Green leaves shall be sampled at BVL130 from three to five individual trees/shrubs/crops representing the dominate species at approximately the same locations where soil samples were collected. Litter and leaf

samples shall immediately be stored under refrigeration. Bulk green leaf and litter samples shall be subsampled for analysis of moisture, total nitrogen (N), and NH<sub>4</sub><sup>+</sup>. For the NH<sub>4</sub><sup>+</sup> analysis, fresh material shall be ground in liquid nitrogen and 5 g of material shall be extracted in 20 mL of deionized water. Extractions shall take place within 72 hours of collections. Extracts shall be analyzed for NH<sub>4</sub><sup>+</sup> by IC or colorimetry. For total N analyses, material shall be dried, ground and analyzed for total N via combustion/elemental analysis. Moisture content shall be determined by weight loss after drying at 60 degrees C to a constant weight. For costing, the contractor shall assume that the upper and lower canopy and individual tree samples shall be bulked for analysis such that each visit will result in 15 samples.

Leaf area index (LAI) shall be measured at seasonally at approximately 15 locations. The contractor shall use the LAI 2000 plant canopy analyzer that was procured by EPA/ORD. LAI sampling locations shall correspond with soil and vegetation sampling locations where possible.

Measuremen	Measurement	Time period	Notes	BVL130	DUK008	CHA467
t Frequency	Canopy Height <sup>1</sup>	Dominate species at start and end of study	LIDAR	LIDAR data exists <sup>1</sup> , but we need to take measurement s of crop canopy height <sup>2</sup>	Existing <sup>1</sup>	Needed <sup>1</sup>
	Vegetation characterizatio n — species type, percentage of each species <sup>1</sup>	LANDFIRE plots at start of study	LANDFIRE	Exisiting <sup>1</sup> , but we need to know what crops are planted <sup>1,2</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
Initial Measurement	Vegetation species density – stems per m <sup>2</sup> or ha <sup>2</sup>	Peak leaf out	LIDAR measurements	Needed <sup>2</sup>	Needed <sup>2</sup>	Needed <sup>2</sup>
(or 1-time measurement	Surface albedo <sup>1</sup>	Initial	Remote sensing data	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
)	Hydrological group <sup>1</sup>	Initial	NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	Quality Rating <sup>1</sup>	Initial	NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	Soil Type – type, percentage of each species <sup>1</sup>	Initial	NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	Soil Characteristics – bulk density, sand/silt/clay, wilt point, field capacity, depth to impervious layer, rooting depth <sup>1</sup>	Initial	NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>

	Age of Plot <sup>1</sup>	Initial	Ag — how many years has plot been cultivated, forest — when was stand last cleared?	Existing <sup>1</sup>	Existing <sup>1</sup>	?
	Overall slope of site <sup>1</sup>		NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	LAI Profiles <sup>2</sup>	Coincide with soil/litter sampling. Measurement s at leaf out, peak LAI, senescence, and minimum LAI	Li-COR LAI 2200C	Take measurement at 15 locations <sup>2</sup>	Take measurement s at 15 locations <sup>2</sup>	Take measurement s at 15 locations <sup>2</sup>
	Bulk leaf tissue pH, total [N] and [NH <sub>4</sub> +] <sup>2</sup>	Seasonally	Dominate species, 4 trees at each location	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>
Seasonal	Litter – depth, composition, pH, total [N] and [NH <sub>4</sub> <sup>+</sup> ] <sup>2</sup>	After leaf drop	Dominate species at soil measurement sites. Same analysis as bulk leaf tissue.	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>
	Soil chemistry (pH, [NH <sub>4</sub> +], and [NO <sub>3</sub> -]) <sup>2</sup>	Seasonally, coincide with vegetation samples	Top two horizons – typically the O (organic) and A (topsoil) horizons for dominate soils/vegetatio n locations.	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>
Hourly	Soil characteristics (moisture, temperature) <sup>2</sup>	Hourly measurement s at 1 location	Locations depend on soil types, vegetation and site slope Temperature probe Campbell Scientific 107 Soil moisture Campbell scientific Soil H <sub>2</sub> O content reflectometer CS650	Take measurement at AMoN site <sup>2</sup>	Take measurement at AMoN site <sup>2</sup>	Take measurement at AMoN site <sup>2</sup>

Meteorology <sup>2</sup>	Hourly, 10 Hz	Standard suite	Take	Take	Take
	temperature	of CASTNET	measurement	measurement	measurement
	and 3d wind	measurements.	at AMoN site <sup>2</sup>	at AMoN site <sup>2</sup>	at AMoN site²
	vectors				

<sup>&</sup>lt;sup>1</sup>EPA will provide measurement or data, <sup>2</sup> Amec Foster Wheeler shall provide collected data

The contractor shall include a technical proposal and cost estimate for the measurements listed above.

#### V. DELIVERABLES AND SCHEDULE

### 1. Proposal

The contractor shall deliver a Task Order Technical Proposal & Cost Estimate in accordance with clause B.7 Task Order Ordering Procedures of the contract. The proposal shall be submitted 10 days after receipt of the SOW.

# 2. Monthly Progress Report

The contractor shall prepare and submit a monthly progress report by the 15<sup>th</sup> of each month summarizing the progress made, issues encountered or expected, work planned for the next reporting period and costs. These reports shall comply with contract clauses F.1, Monthly Progress Report, and F-5, Reports of Work. Reports shall be delivered electronically.

### 3. Database

The contractor shall deliver a database with valid data and all QA/QC data reported during the field campaign. The database shall be delivered 90 days after the final measurement is taken.

#### 4. Publication

Within 6-months after the final sample is collected, the contractor shall work with the TOPOs and technical advisors to prepare an EPA summary report.

#### **Distribution of Deliverables:**

Addressee	Copies
EPA Contracting Officer (Mike Fox)	1
EPA Project Officer (Melissa Puchalski)	1
EPA Alternate (Taylor Macy)	1
EPA Technical Advisors (Ralph Baumgardner and John Walker	) 1

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts							
Period	Previous Amount	This Action	Amount				
Base Period		\$15,000.00	\$15,000.00				
Total	<u>.</u>	\$15,000.00	\$15,000.00				

	Total Task Order Ceiling							
Period	Previous Amount	This Action	Amount					
Base Period	-	\$68,720.00	\$68,720.00					
Total	1	\$68,720.00	\$68,720.00					

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

AMENDMENT OF SOLICITATION/MODIFIC	CATION OF CO	NTRACT	1. CONTRACT ID CODE	PAGE OF PAGES
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE (	DATE	L 4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
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6. ISSUED BY CODE	HPOD		7. ADMINISTERED BY (If other than Item 6)	CODE
HPOD US Environmental Protection William Jefferson Clinton B 1200 Pennsylvania Avenue, N Mail Code: 3803R Washington DC 20460	uilding			
8. NAME AND ADDRESS OF CONTRACTOR (No., street	et. county. State and Z	IP Code)	9A. AMENDMENT OF SOLICITATION NO.	
WOOD ENVIRONMENT & INFRASTRUCT Attn: JOSEPH FARRELL 751 Arbor Way Ste 180 Blue Bell PA 194221972		ons, Inc.	9B. DATED (SEE ITEM 11)  10A. MODIFICATION OF CONTRACT/ORD EP-W-16-015 68HE0H18F1540 10B. DATED (SEE ITEM 13)	ER NO.
CODE 038086125	FACILITY CODE			
ODE 038086125			06/28/2018 MENDMENTS OF SOLICITATIONS	
separate letter or telegram which includes a reference THE PLACE DESIGNATED FOR THE RECEIPT OF virtue of this amendment you desire to change an of reference to the solicitation and this amendment, and	e to the solicitation OFFERS PRIOR T fer already submitted t is received prior to	and amendment numbe TO THE HOUR AND DAT ed , such change may be to the opening hour and d	E SPECIFIED MAY RESULT IN REJECTION O made by telegram or letter, provided each telegrate specified.	IT TO BE RECEIVED AT F YOUR OFFER If by ram or letter makes
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D. OTHER (Specify type of modification	n and authority)			
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E. IMPORTANT: Contractor 🗵 is not.	20-14-		return copies to the is	ssuing office.
14. DESCRIPTION OF AMENDMENT/MODIFICATION DUNS Number: 038086125 The purpose of this modification \$35,000.00 to this task order	ation is t			
This is a Time-and-Materials which the Contractor is not			1.20 = 27	
The total obligated/funded order is incrementally funder and Attachment B is hereby: TOCOR: Melissa Puchalski Continued Except as provided herein, all terms and conditions of	ed as deta incorporat	iled in Atta ed (1 page).	chment B Summary of Amou	unts and Ceilings
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15B. CONTRACTOR/OFFEROR	1	ISC. DATE SIGNED	16B. UNITED STATES OF AMERICA	6L FOTRONIC 5:GNATURE 07/27/2018

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 OF

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NAME OF OFFEROR OR CONTRACTOR

ITEM NO.	SUPPLIES/SERVICES	QUANTITY		UNIT PRICE	AMOUNT
(A)	(B)	(C)	(D)	(E)	(F)
	LIST OF CHANGES:				
	Reason for Modification: Funding Only Action				
	Obligated Amount for this Modification: \$35,000.00				
	New Total Obligated Amount for this Award:				
	\$50,000.00				
	Incremental Funded Amount changed: from				
	\$15,000.00 to \$50,000.00				
	CHANGES FOR LINE ITEM NUMBER: 1				
	Obligated Amount for this Modification: \$35,000.00				
	Incremental Funded Amount changed from \$15,000.00				
	to \$50,000.00				
	FOB changed from Destination to				
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	18-19-C-58D5-000A45-2505-1858DC8083-001				
	Beginning Fiscal Year 10				
	Ending Fiscal Year 19				
	Fund (Appropriation) C				
	Budget Organization 58D5				
	Program (PRC) 000A45				
	Budget (BOC) 2505				
	Job # (Site/Project)				
	Cost Organization				
	DCN-LineID 1858DC8083-001				
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	RTP Finance Center				
	US Environmental Protection Agency				
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	109 TW Alexander Drive				
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	Durham NC 27711				
	Period of Performance: 07/09/2018 to 07/08/2019				
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Contract#: EP-W-16-015 Task Order#: 68HE0H18F1540

Project#: 2010

Modification: P00001

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts							
Period	Previous Amount	This Action	Amount				
Base Period	\$15,000.00	\$35,000.00	\$50,000.00				
Total	\$15,000.00	\$35,000.00	\$50,000.00				

Total Task Order Ceiling								
Period	Previous Amount	This Action	Amount					
Base Period	\$68,720.00	-	\$68,720.00					
Total	\$68,720.00	-	\$68,720.00					

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

AMENDMENT OF SOLICITATION/MODIFIC	ATION OF CO	NTRACT		1. CONTRACT ID CODE	OF PAGES		
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE	DATE	4. REQU	IISITION/PURCHASE REQ. NO.	5. PROJECT	∠ NO. (If applicable)	
P00002	See Bloc	k 16C_	PR-OF	RD-18-01865	2010		
6. ISSUED BY CODE	HPOD		7. ADM	NISTERED BY (If other than Item 6)	CODE		
HPOD US Environmental Protection William Jefferson Clinton Bu 1200 Pennsylvania Avenue, N. Mail Code: 3803R Washington DC 20460	uilding						
8. NAME AND ADDRESS OF CONTRACTOR (No., street	t, county. State and 2	ZIP Code)	(x) 9A.	AMENDMENT OF SOLICITATION NO.			
WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC. Attn: JOSEPH FARRELL 751 Arbor Way Ste 180 Blue Bell PA 194221972				DATED (SEE ITEM 11)  MODIFICATION OF CONTRACT/ORDER I -W-16-015  HE 0 H 1 8 F 1 5 4 0  DATED (SEE ITEM 13)	NO.		
CODE 038086125	FACILITY COD	F					
ODE 038086125				1/28/2018 INTS OF SOLICITATIONS			
separate letter or telegram which includes a reference THE PLACE DESIGNATED FOR THE RECEIPT OF overture of this amendment you desire to change an offer reference to the solicitation and this amendment, and 12. ACCOUNTING AND APPROPRIATION DATA (If regions of the solicitation and the same desired in the same desired	OFFERS PRIOR of already submitted is received prior to the contract of the con	TO THE HOUR AND DAT ed , such change may be o the opening hour and d	TE SPEC e made b date spec	IFIED MAY RESULT IN REJECTION OF YOU telegram or letter, provided each telegram iffied.	OUR OFFER I	f by	
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	CT/ORDER IS MO H IN ITEM 14, PU	DDIFIED TO REFLECT TI RSUANT TO THE AUTH	THE ADM HORITY (	INISTRATIVE CHANGES (such as changes of FAR 43.103(b).			
D. OTHER (Specify type of modification	• ,						
X FAR 52.232-22 Limita	ation of :	Funds					
E. IMPORTANT: Contractor ⊠ is not.  14. DESCRIPTION OF AMENDMENT/MODIFICATION  DUNS Number: 038086125				copies to the issui	P3		
The purpose of this modifica	tion is t	o obligate i	incre	mental funding in the	amount	of	
\$18,720.00 to this task orde	r.						
This is a Time-and-Materials which the Contractor is not							
The total obligated/funded corder is fully-funded as det Attachment B is hereby incor TOCOR: Melissa Puchalski Continued	ailed in porated	Attachment B(1 page).	B Sum	mary of Amounts and Ce	eilings	and	
Except as provided herein, all terms and conditions of the 15A. NAME AND TITLE OF SIGNER (Type or print)	e accument refer	enced in item 9 A or 10A		Notion of the change of the contracting of the contraction of the cont			
				nael C. Fox			
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED	D 16B. UNITED STATES OF AMERICA 16C. DATE SIGNED				
(Signature of parson authorized to sign)				(Signature of Contracting Officer)	#	08/15/2018	

 CONTINUATION SHEET
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 OF

 EP-W-16-015/68HE0H18F1540/P00002
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NAME OF OFFEROR OR CONTRACTOR

NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
)	(B)	(C)	(D)	(E)	(F)
	LIST OF CHANGES:				
	Reason for Modification: Funding Only Action				
	Obligated Amount for this Modification: \$18,720.00				
	New Total Obligated Amount for this Award:				
	\$68,720.00				
	Incremental Funded Amount changed: from				
	\$50,000.00 to \$68,720.00				
	CHANGES FOR LINE ITEM NUMBER: 1				
	Obligated Amount for this Modification: \$18,720.00				
	Incremental Funded Amount changed from \$50,000.00				
	to \$68,720.00				
	NEW ACCOUNTING CODE ADDED:				
	Account code:				
	18-19-C-26UC000-000FK8XPW-2532-26A6A-1826UCE034-00				
	1 19 C 200C000 000FR0XFW 2332 20A0A 10200CE034 00				
	Beginning FiscalYear 18				
	Ending Fiscal Year 19				
	Fund (Appropriation) C				
	Budget Organization 26UC000				
	Program (PRC) 000FK8XPW				
	Budget (BOC) 2532				
	Job # (Site/Project)				
	Cost Organization 26A6A				
	DCN-LineID 1826UCE034-001				
	Amount: \$18,720.00				
	Subject To Funding: N				
	Payment Address:				
	Payment:				
	RTP Finance Center				
	US Environmental Protection Agency				
	RTP-Finance Center (AA216-01)				
	109 TW Alexander Drive				
	www2.epa.gov/financial/contracts				
	Durham NC 27711				
	Period of Performance: 07/09/2018 to 07/08/2019				
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Contract#: EP-W-16-015 Task Order#: 68HE0H18F1540

Project#: 2010

Modification: P00002

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts								
Period	<b>Previous Amount</b>	This Action	Amount					
Base Period	\$50,000.00	\$18,720.00	\$68,720.00					
Total	\$50,000.00	\$18,720.00	\$68,720.00					

Total Task Order Ceiling								
Period	Previous Amount	This Action	Amount					
Base Period	\$68,720.00	-	\$68,720.00					
Total	\$68,720.00	-	\$68,720.00					

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

AMENDME	NT OF SOLICITATION/MODIFICA	ATION OF CO	NTRACT		CONTRACT ID CODE	PAGE	OF PAGES
2. AMENDME	NT/MODIFICATION NO.	3. EFFECTIVE I	DATE	4. RE	L QUISITION/PURCHASE REQ. NO.	5. PROJEC	T NO. (If applicable)
P00003		See Bloc	k 16C	PR-(	DRD-19-00804	2010	
6. ISSUED BY	CODE	HPOD		7. AD	MINISTERED BY (If other than Item 6)	CODE	
William 1200 Pe Mail Co	ronmental Protection Jefferson Clinton Bu nnsylvania Avenue, N. de: 3803R ton DC 20460	ilding				_	
	the state of the state of the box	, county, State and 2	ZIP Code)	(x) 9A	. AMENDMENT OF SOLICITATION NO.		-
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)  WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.  Attn: JOSEPH FARRELL  751 Arbor Way  Ste 180  Blue Bell PA 194221972					A. MODIFICATION OF CONTRACT/ORDER NO $P-W-16-015$ 8 HE $0H18F1540$ B. DATED (SEE ITEM 13)	<b>D</b> .	
CODE 03	8086125	FACILITY CODI	<u> </u>		06/28/2018		
	( A, E	 11, THIS ITE	M ONLY APPLIES TO AN		MENTS OF SOLICITATIONS		
Items 8 and separate lef RECEIVED OFFER. If each letter of	15, and returning cop tter or electronic communication which inclu AT THE PLACE DESIGNATED FOR THE by virtue of this amendment you desire to c	oies of the amend udes a reference RECEIPT OF OF change an offer al nce to the solicitat	ment; (b) By acknowledg to the solicitation and am FERS PRIOR TO THE H ready submitted, such c ion and this amendment,	ging re nendm HOUR change , and i	ion or as amended, by one of the following met ceipt of this amendment on each copy of the offent numbers. FAILURE OF YOUR ACKNOWLI AND DATE SPECIFIED MAY RESULT IN REJE may be made by letter or electronic communics received prior to the opening hour and date specified.	er submitted EDGEMENT CTION OF Yeation, provider ecified.	; or (c) By TO BE OUR d
See Sch		игөа)	Net	In	crease: \$3	37,312.	00
CHECK ONE	B. THE ABOVE NUMBERED CONTRAC appropriation data, etc.) SET FORTH C. THIS SUPPLEMENTAL AGREEMENT	CT/ORDER IS MO I IN ITEM 14, PUI T IS ENTERED IN	DDIFIED TO REFLECT TO RSUANT TO THE AUTH	HE AD	GES SET FORTH IN ITEM 14 ARE MADE IN THE MINISTRATIVE CHANGES (such as changes in YOF FAR 43.103(b).		
v	D. OTHER (Specify type of modification	***	ios				
E. IMPORTAN	Mutual Agreement of T: Contractor 🗵 is not	8C36	sign this document and	rotum.	copies to the issuing	. office	
DUNS Nur The purp Accordar and cost being in funded a	mber: 038086125  pose of this modifica- nce with Attachment A t proposal dated Apri- ncreased by \$43,500.00 as detailed in Attach	tion is t , Revised 1 25, 201 0 from \$6	o incorporat Statement o 9 (13 pages) 8,720.00 to	e tof W • T • \$11	he revised statement of ork (8 pages) and the retail price of this tage. This order is income and Ceilings and Attac	work i evised task or crement	technical der is ally
This is which the Continue	ne Contractor is not a	(T&M) ta authorize	ed to exceed.	Th	total ceiling price of e Contractor exceeds at eretofore changed, remains unchanged and in fundamental contracting of the contr	its Ow ullforce and e	n risk. effect.
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15B. CONTRA	ACTOR/OFFEROR		15C. DATE SIGNED		Monteus :	FETRONIC S:GNATURE	
	(Signature of person authorized to sign)				(Signature of Contracting Officer)		

CONTINUATION SHEET REFERENCE NO. OF DOCUMENT BEING CONTINUED EP-W-16-015/68HE0H18F1540/P00003

NAME OF OFFEROR OR CONTRACTOR

WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.

EM NO.	SUPPLIES/SERVICES	QUANTITY		UNIT PRICE	AMOUNT
A)	(B)	(C)	(D)	(E)	(F)
	The total obligated/funded ceiling amount for		1		
	this order is currently \$106,032.00. This order				
	is incrementally funded as detailed in Attachment				
	B Summary of Amounts and Ceilings and Attachment				
	B is hereby incorporated (1 page).				
	TOCOR: Melissa Puchalski				
	TOCON: Melissa ruchalski				
	LIST OF CHANGES:				
	Reason for Modification: Supplemental Agreement				
	for work within scope				
	Total Amount for this Modification: \$43,500.00				
	New Total Amount for this Version: \$112,220.00				
	New Total Amount for this Award: \$112,220.00				
	Obligated Amount for this Modification: \$37,312.00				
	200				
	New Total Obligated Amount for this Award:				
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	\$68,720.00 to \$106,032.00				
	CHANGES FOR LINE ITEM NUMBER: 1				
	Total Amount changed				
	from \$68,720.00 to \$112,220.00				
	Obligated Amount for this Modification: \$37,312.00				
	Incremental Funded Amount changed from \$68,720.00				
	to \$106,032.00				
	CHANGES FOR DELIVERY LOCATION: OAR/OAP				
	Amount changed from \$68,720.00 to \$112,220.00				
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	Account code:				
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	Ending Fiscal Year 19				
	Fund (Appropriation) C				
	Budget Organization 26CF000				
	Program (PRC) 000FK6XR2				
	Budget (BOC) 2532				
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	Payment Address:				
	RTP Finance Center				
	US Environmental Protection Agency				
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NAME OF OFFEROR OR CONTRACTOR

WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.

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	www2.epa.gov/financial/contracts				
	Durham NC 27711				
	NEW ACCOUNTING CODE ADDED:				
	Account code:				
	18-19-C-26CF000-000FK8-2532-26A5C-1926CFE020-002				
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	Ending Fiscal Year 19				
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	Budget Organization 26CF000				
	Program (PRC) 000FK8				
	Budget (BOC) 2532				
	Job # (Site/Project)				
	Cost Organization 26A5C				
	DCN-LineID 1926CFE020-002				
	Amount: \$3,097.49				
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	109 TW Alexander Drive				
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	Durham NC 27711				
	NEW ACCOUNTING CODE ADDED:				
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	Ending Fiscal Year 20				
	Fund (Appropriation) C				
	Budget Organization 26CF000				
	Program (PRC) 000FK8				
	Budget (BOC) 2532				
	Job # (Site/Project)				
	Cost Organization 26A5C				
	DCN-LineID 1926CFE020-003				
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	US Environmental Protection Agency				
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NAME OF OFFEROR OR CONTRACTOR

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	US Environmental Protection Agency				
	RTP-Finance Center (AA216-01)				
	109 TW Alexander Drive				
	www2.epa.gov/financial/contracts				
	Durham NC 27711				
	Period of Performance: 07/09/2018 to 07/08/2019				
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#### ATTACHMENT A

**Title:** Supplemental Monitoring Studies at CASTNET Sites in Support of

the NOx/SOx Secondary Standard (2010)

**Contractor:** Wood Environment & Infrastructure Solutions, Inc.

**Mod #:** 3

**Period of Performance:** 7/9/2018 to 7/8/2019

### **EPA Key Personnel**

# Task Order Project Officer (TOPO)/Contract Level Project Officer (PO):

Melissa Puchalski Clean Air Markets Division (OAP/OAR/CAMD) 1200 Pennsylvania Ave., NW Mail Code 6204M Washington, DC 20460 phone: (202) 343-9882

email: puchalski.melissa@epa.gov

### **Alternate TOPO:**

Taylor Macy Clean Air Markets Division (OAP/OAR/CAMD) 1200 Pennsylvania Ave., NW Mail Code 6204M Washington, DC 20460 phone: (202) 343-9183 email: macy.taylor@epa.gov

# **Contracting Officer (CO):**

Michael Fox Contracting Officer Administrative Contract Service Center 1200 Pennsylvania Ave N.W. Mail Code 3803R Washington DC 20460 phone: (202) 564-2550

email: fox.michael@epa.gov

#### STATEMENT OF WORK

#### I. INTRODUCTION

The Clean Air Status and Trends Network (CASTNET) is a long-term environmental monitoring network that measures changes in ambient air quality and assesses atmospheric deposition over broad geographic regions of the U.S. (<a href="https://www.epa.gov/castnet">https://www.epa.gov/castnet</a>). Operating since 1987, CASTNET has evolved into a robust regional monitoring program which currently consists of approximately 95 monitoring stations nationwide. The Environmental Protection Agency (EPA) coordinates the operation of the network in cooperation with numerous federal, tribal, state and local partners.

The primary monitoring objectives of CASTNET are to:

- Provide high quality data on atmospheric deposition, rural ground level ozone and other forms of atmospheric pollution;
- Support the primary and secondary ozone NAAQS and provide data on NAAQS compliance in rural areas;
- Monitor the status and trends in regional air quality and atmospheric deposition;
- Assess and report on geographic patterns and long-term, temporal trends in ambient air pollution and atmospheric deposition;
- Improve our understanding of PM and ozone formation;
- Validate and improve atmospheric models;
- Provide data for health-based research and epidemiology studies;
- Assess the effectiveness of EPA's emission reduction programs; and
- Support science and ecosystem studies.

CASTNET sites measure weekly average concentrations of sulfate (SO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>), sulfur dioxide (SO<sub>2</sub>), nitric acid (HNO<sub>3</sub>), chloride (Cl<sup>-</sup>) and the base cations (Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>and Ca<sup>2+</sup>) using a 3-stage filter pack. In addition, each site may make ancillary measurements, including hourly ozone (O<sub>3</sub>), hourly meteorology, ammonia (NH<sub>3</sub>) gas using passive devices, and trace-level gases. Trace-level gas monitors include reactive oxidized nitrogen (NOy), nitric oxide (NO), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO). CASTNET O<sub>3</sub>, meteorological, and trace gas measurements follow the requirements in the Code of Federal Regulations (CFR) and EPA's Quality Assurance Handbook.

### II. PURPOSE

The primary purpose of this task order is to improve the science and understanding of deposition process within the atmosphere. The EPA is currently evaluating the secondary National Ambient Air Quality Standard (NAAQS) for NOx and SOx. The work under this task will enhance the existing research currently available on direct deposition methods, atmospheric chemical processes that drive deposition parameters and estimates of sulfur and nitrogen loading to various landscapes. This research is a collaborative effort between EPA's Office of Air and Radiation (OAR), the Office of Research and Development (ORD), and other federal partners. This is a follow-on task order from the previous option periods.

Under this task order the contractor will continue to operate the enhanced NOy analyzer at the Duke Forest flux tower site located in <u>Research Triangle Park</u>, North Carolina. The enhanced NOy analyzer will operate at the Duke Forest tower site through <u>June the end of the Period of Performance 2019</u> as part of a larger reactive nitrogen flux study. Results from the enhanced NOy analyzer will be compared to the <u>Monitor for AeRosols and Gases in Ambient Air (MARGA)</u>, the CASTNET filter pack, and passive samplers. <u>The Duke Forest</u>

research site currently features a National Atmsopheric Deposition Program (NADP) Ammonia Monitoring Network (AMoN) site (NC98) and a small footprint CASTNET site.

Also-Additionally under this task order, the contactor will-shall continue collecting the site characterization dataset for 3 co-located CASTNET/AMoN sites. The dataset shall contain information about the soil and vegetation characteristics within 1km of each AMoN site. The contractor shall collect soil and vegetation samples at approximately 15 locations at each site for laboratory analysis. A bi-direction flux box model will be run using the site characterization information as input to calculate NH<sub>3</sub> fluxes at each site. The three sites where measurements shall be made are Bondville, IL (BVL130), Duke Forest, NC (DUK008), and Chiricahua National Monument, AZ (CHA467). Under the previous option period field sampling was completed for the fall, winter and spring seasons. Sampling under this task order will complete the summer sampling at each of the 3 sites. Under this task order work will continue on the data analysis and preparation for modeling NH<sub>3</sub> deposition.

The purpose of this revision to the SOW is to include incorporating the enhanced NOy calibration system into the fast response Ecophysics NOy system and designing and building an inlet system for the Ecophysics system.

Additionally, under this task order the contractor shall write Standard Operating Procedures (SOPs) for a Conditional time-averaged gradient (COTAG) system. The COTAG system allows for 1-4 week averaged samples to be used for measuring dry deposition. This is a low-cost, low maintenance system that could be deployed at CASTNET sites to provide dry deposition estimates and validate existing flux estimates from the Community Multi-scale Air Quality Model (CMAQ) which provides deposition velocities for CASTNET grid cells.

#### III. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this task order are consistent with the activities authorized in <u>CLIN\_Task\_22</u> (<u>Level of Effort</u>) of the contract's Statement of Work <u>for Contract EP-W-16-015</u>.

#### IV. TECHNICAL DIRECTION

# 1. Prepare a Technical Proposal & Cost Estimate

The Contractor shall prepare a Task Order <u>Technical Proposal and Cost Estimate (TP&CE)</u> in accordance with the terms and conditions of contract clauses B.<u>21</u> entitled Fixed Rates for Services – Indefinite delivery/Indefinite quantity contract.

# 2. Operate, Calibrate, and Quality Assure the Enhanced-NOy Measurement System

The Contractor shall continue operating the enhanced-NOy measurement system at the Duke Forest Flux Tower site (DUK008) which is co-located with a CASTNET filter pack. Operation includes routine calibrations, remote troubleshooting, QA, and data reporting. The operation of the standard NOy system and the CASTNET filter pack is covered under Task Order 200368HE0H18F1533 Base Program Operations (2003). Hourly measurements from the enhanced NOy system include NHx, TNx, true NO2, NOy, NO, and HNO3. The contractor shall perform automated quality control checks of the analyzer(s) at least once per week. At the Duke Forest site, the enhanced NOy inlet is placed above the forest canopy on the 150ft tower.

Data from the enhanced NOy measurement system shall be delivered to CAMD daily with the routine CASTNET submittals. Quality assured data shall be submitted to CAMD monthly, 90 days after data collection.

Under this task the contractor shall also continue testing the converters for a configuration that provides the most reliable, accurate data as compared to the CASTNET filterpack, AMoN and MARGA system at Duke Forest. Further testing on the calibration system is also expected.

This task includes 4 repair trips for the enhanced NOy measurement system that shall only be used as necessary. Remote troubleshooting shall be utilized when possible.

#### 3. Ammonia Flux Site Characterization Database

The contractor installed measurement systems to collect soil moisture and temperature, 3D wind direction, and CASTNET meteorology at three CASTNET sites to develop a database of site characteristics for modeling the bi-directional flux of NH<sub>3</sub> under Task Orders 0010 and 1010. The contractor also visited each site to collect soil and vegetation samples for analysis. This task is a continuation of this work. The contractor shall complete the seasonal sampling – with one final site visit to Bondville to complete summer soil and vegetation sampling. Additionally, the contractor shall continue to collect hourly meteorological measurements and poll the data remotely through July 2018. Meteorological measurements will be covered under Task Order 2003 Base Program.

After final sampling, the contractor shall provide EPA with a final data set that can be used to model deposition fluxes at the 3 monitoring sites. The final data set shall be documented and published on the EPA website. The contractor shall estimate labor hours for producing a final summary report on the field sampling campaign.

A description of the field measurements is included below. Only one final sampling campaign will take place under this task order.

Soil moisture and temperature sensors and sonic anemometers were installed under Task Order 0010. Sonic anemometer measurements of 3-dimensional wind (vectors u, v, w) and temperature shall be recorded at 10 Hertz. The contractor shall continue to run a post-processing package to perform data filtering, coordinate rotations, calculations of 30 minute or hourly turbulence statistics and apply QA metrics from the sonic anemometer.

Hourly data shall be stored in Oracle and submitted to CAMD daily. Quality assured results shall be submitted 90 days after measurements are recorded or analyzed.

This task also includes removing the soil moisture meter, meteorological equipment and data loggers once the study is over. The contractor may request that the site operators or calibrators remove the equipment if appropriate.

EPA has provided the contractor with sampling locations within a 1-km radius of each site. The locations were selected based on soil and vegetation type as reported in national online databases. The contractor shall use the sample locations as a guide when collecting the soil and vegetation samples, keeping in mind that the goal is to collect the dominate species and/or soil type.

Sample measurements and schedules are included in Table 1. The measurements are labeled to indicate if the contractor shall be responsible for the cost of the measurement. A brief description of the measurements that the contractor will be collecting is found below.

Approximately 30 composite soil samples will be collected from 15 locations and analyzed at the BVL130 site. At each of the 15 locations, 5 soil cores will be collected with a 1-m by 1-m plot. The sample depth will capture

the organic (O) topsoil (A) horizons. Individual cores shall be separated into the horizons and the five replicate samples shall be composited by horizon and measurement location generation a total of 15 O-horizon and 15 A-horizon samples per pilot site per season. Soil shall be immediately stored under refrigeration and extracted within 72 hours. Samples shall be analyzed for extractable NH<sub>4</sub><sup>+</sup> and pH. For the NH<sub>4</sub><sup>+</sup> analysis, five grams of field moist soil shall be extracted in 20 g of 0.01 molar CaCl<sub>2</sub> following standard protocols. Samples shall be analyzed by ion chromatography (IC) or colorimetry by the chosen laboratory. Direct determination of pH shall be performed on a 1:5 fresh soil/water slurry. Soil gravimetric moisture shall be determined by weight loss after heating 25 g of soil for 24 hours at 105 degrees Celsius (C).

Leaf litter shall be collected on the soil surface in the sample 15 locations as the soil samples were taken. Leaf litter, where available, shall be collected seasonally. Approximately 50 g of leaf litter shall be collected within the 1x1m soil sampling location.

Green leaves shall be sampled at BVL130 from three to five individual trees/shrubs/crops representing the dominate species at approximately the same locations where soil samples were collected. Litter and leaf samples shall immediately be stored under refrigeration. Bulk green leaf and litter samples shall be subsampled for analysis of moisture, total nitrogen (N), and NH<sub>4</sub><sup>+</sup>. For the NH<sub>4</sub><sup>+</sup> analysis, fresh material shall be ground in liquid nitrogen and 5 g of material shall be extracted in 20 mL of deionized water. Extractions shall take place within 72 hours of collections. Extracts shall be analyzed for NH<sub>4</sub><sup>+</sup> by IC or colorimetry. For total N analyses, material shall be dried, ground and analyzed for total N via combustion/elemental analysis. Moisture content shall be determined by weight loss after drying at 60 degrees C to a constant weight. For costing, the contractor shall assume that the upper and lower canopy and individual tree samples shall be bulked for analysis such that each visit will result in 15 samples.

Leaf area index (LAI) shall be measured at seasonally at approximately 15 locations. The contractor shall use the LAI 2000 plant canopy analyzer that was procured by EPA/ORD. LAI sampling locations shall correspond with soil and vegetation sampling locations where possible.

Measuremen t Frequency	Measurement	Time period	Notes	BVL130	DUK008	CHA467
	Canopy Height <sup>1</sup>	Dominate species at start and end of study	LIDAR	LIDAR data exists <sup>1</sup> , but we need to take measurement s of crop canopy height <sup>2</sup>	Existing <sup>1</sup>	Needed <sup>1</sup>
Initial Measurement (or 1-time measurement )	Vegetation characterizatio n – species type, percentage of each species <sup>1</sup>	LANDFIRE plots at start of study	LANDFIRE	Exisiting <sup>1</sup> , but we need to know what crops are planted <sup>1,2</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	Vegetation species density – stems per m² or ha²	Peak leaf out	LIDAR measurements	Needed <sup>2</sup>	Needed <sup>2</sup>	Needed <sup>2</sup>
	Surface albedo <sup>1</sup>	Initial	Remote sensing data	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>

	Hydrological group <sup>1</sup>	Initial	NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	Quality Rating <sup>1</sup>	Initial	NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	Soil Type – type, percentage of each species <sup>1</sup>	Initial	NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	Soil Characteristics – bulk density, sand/silt/clay, wilt point, field capacity, depth to impervious layer, rooting depth <sup>1</sup>	Initial	NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	Age of Plot <sup>1</sup>	Initial	Ag — how many years has plot been cultivated, forest — when was stand last cleared?	Existing <sup>1</sup>	Existing <sup>1</sup>	?
	Overall slope of site <sup>1</sup>		NRCS WSS	Existing <sup>1</sup>	Existing <sup>1</sup>	Existing <sup>1</sup>
	LAI Profiles <sup>2</sup>	Coincide with soil/litter sampling. Measurement s at leaf out, peak LAI, senescence, and minimum LAI	Li-COR LAI 2200C	Take measurement at 15 locations <sup>2</sup>	Take measurement s at 15 locations <sup>2</sup>	Take measurement s at 15 locations <sup>2</sup>
	Bulk leaf tissue pH, total [N] and $[NH_4^+]^2$	Seasonally	Dominate species, 4 trees at each location	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>
Seasonal	Litter – depth, composition, pH, total [N] and [NH <sub>4</sub> +] <sup>2</sup>	After leaf drop	Dominate species at soil measurement sites. Same analysis as bulk leaf tissue.	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>
	Soil chemistry (pH, [NH4 <sup>+</sup> ], and [NO <sub>3</sub> -]) <sup>2</sup>	Seasonally, coincide with vegetation samples	Top two horizons — typically the O (organic) and A (topsoil) horizons for dominate soils/vegetatio n locations.	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>	Take measurement s at 15 sites <sup>2</sup>

	Soil	Hourly	Locations	Take	Take	Take
	characteristics	measurement	depend on soil	measurement	measurement	measurement
	(moisture,	s at 1 location	types,	at AMoN site²	at AMoN site <sup>2</sup>	at AMoN site <sup>2</sup>
	temperature) <sup>2</sup>		vegetation and			
			site slope			
			Temperature			
			probe			
			Campbell			
			Scientific 107			
Hourly			Soil moisture			
			Campbell			
			scientific Soil			
			H <sub>2</sub> O content			
			reflectometer			
			CS650			
	Meteorology <sup>2</sup>	Hourly, 10 Hz	Standard suite	Take	Take	Take
		temperature	of CASTNET	measurement	measurement	measurement
		and 3d wind	measurements.	at AMoN site²	at AMoN site <sup>2</sup>	at AMoN site <sup>2</sup>
		vectors				

<sup>&</sup>lt;sup>1</sup>EPA will provide measurement or data, <sup>2</sup> Amec Foster Wheeler shall provide collected data

The contractor shall include a technical proposal and cost estimate for the measurements listed above.

# 4. Standard Operating Procedures (SOPs) for the Conditional Time Averaged Gradient (COTAG) Technique

The contractor shall develop SOPs for the COTAG denuder/filter pack system for deploying the system in network (i.e. CASTNET). SOPs shall include coating and extracting the filter packs and denuders, analyzing the extracts, and developing QA/QC procedures for the laboratory preparation and analysis. Also included in the SOPs should be recommendations for how to ship the denuder/filter packs to remote monitoring sites without compromising the new or exposed samples.

Additional measurements that are included in a COTAG system, including turbulence, temperature, wind direction, stability and heat flux are not included in the SOPs under this task.

A draft of the SOPs shall be delivered by May 30<sup>th</sup>. After final comments from EPA, the final draft of the SOPs shall be delivered within 30 days.

### 5. Design and Test Ecophysics Inlet

ORD will ship the Ecophysics instrument to the contractor for designing a custom inlet. Once the instrument in received, the contractor shall design an inlet and control box for switching between NOy and NO2 on one channel and include a second channel for Total N. The contractor shall design and test the inlet prior to installation on the Duke Forest Flux tower. The inlet will be near the top of the tower above the canopy. The contractor shall procure the equipment (NO2 photolytic converter and stainless steel converter) and supplies needed to design and build the inlet for installation above the canopy on the flux tower.

While the contractor is designing and testing the inlet they shall also become familiar with the software and options for automated calibrations. The contractor shall work with EPA to determine how often calibrations should be performed given the fast response and any drift in the converters. Zero checks may need to be performed frequently using the existing Ecophysics zero system that can be programmed to run zero air through the inlet and the photomultiplier tube (PMT).

# 6. Install Ecophyics System and Integrate z/p/s Checks at Duke Forest

The contractor shall install the Ecophysics system at Duke Forest with the newly designed inlet in the early summer. At the time of the install, the contractor shall integrate the calibration gas delivery system from the Enhanced NOy system into the Ecophysics for routine QC checks. The contractor shall procure or use the existing data logger for programming the Ecophysics automated zero, span and precision checks.

Ambient and QC data from the Ecophysics shall be polled by the contractor's data acquisition system and reported in the CASTNET database.

#### V. DELIVERABLES AND SCHEDULE

# 1. Proposal

The contractor shall deliver a Task Order Technical Proposal & Cost Estimate in accordance with clause B.7 Task Order Ordering Procedures of the contract. The proposal shall be submitted 10 days after receipt of the SOW.

# 2. Monthly Progress Report

The contractor shall prepare and submit a monthly progress report by the 15<sup>th</sup> of each month summarizing the progress made, issues encountered or expected, work planned for the next reporting period and costs. These reports shall comply with contract clauses F.+1, Monthly Progress Report, and F-5, Reports of Work. Reports shall be delivered electronically.

#### 3. Site Characterization Database

The contractor shall deliver a database with valid data and all QA/QC data reported during the field campaign. The database shall be delivered 90 days after the final measurement is taken. <u>Additional details on database submittal included in AMoN Characterization Study</u> Data Deliverables R3.docx.

### 4. Publication

Within 6-months after the final sample is collected, the contractor shall work with the TOPOs and technical advisors to prepare an EPA summary report.

# 5. Standard Operation Procedures for COTAG System

The contractor shall deliver a draft of the SOPs for the COTAG system by May 30<sup>th</sup>. A final draft shall be prepared 30 days after comments are received from EPA.

### **Distribution of Deliverables:**

Addressee	Copies
EPA Contracting Officer (Mike Fox)	1
EPA Project Officer (Melissa Puchalski)	1
EPA Alternate (Taylor Macy)	1
EPA Technical Advisors (Ralph Baumgardner and John Walker	·) 1

Contract#: EP-W-16-015 Task Order#: 68HE0H18F1540

Project#: 2010

Modification: P00003

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts							
Period	Previous Amount	This Action	Amount				
Base Period	\$68,720.00	\$37,312.00	\$106,032.00				
Total	\$68,720.00	\$37,312.00	\$106,032.00				

	Total	Task Order Ceiling	
Period	Previous Amount	This Action	Amount
Base Period	\$68,720.00	\$43,500.00	\$112,220.00
Total	\$68,720.00	\$43,500.00	\$112,220.00

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

AMENDMENT OF SOLICITATION/MODIFIC	ATION OF CO	ONTRACT	1. CONTRACT ID CODE	PAGE OF PAGES
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE	DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
P00004	See Bloo	ck 16C		2010
6. ISSUED BY CODE	HPOD		7. ADMINISTERED BY (If other than Item 6)	CODE
HPOD US Environmental Protection William Jefferson Clinton Bu 1200 Pennsylvania Avenue, N. Mail Code: 3803R Washington DC 20460	uilding			
8. NAME AND ADDRESS OF CONTRACTOR (No., street	t county State and	7IP Code)	9A. AMENDMENT OF SOLICITATION NO.	
WOOD ENVIRONMENT & INFRASTRUCTU Attn: JOSEPH FARRELL 751 Arbor Way Ste 180 Blue Bell PA 194221972		ONS, INC.	9B. DATED (SEE ITEM 11)  10A. MODIFICATION OF CONTRACT/ORDE EP-W-16-015 68HE0H18F1540  10B. DATED (SEE ITEM 13)	R NO.
CODE 038086125	FACILITY COD			
CODE 038086125			06/28/2018 MENDMENTS OF SOLICITATIONS	
separate letter or electronic communication which ind RECEIVED AT THE PLACE DESIGNATED FOR THE OFFER. If by virtue of this amendment you desire to each letter or electronic communication makes refered 12. ACCOUNTING AND APPROPRIATION DATA (If required See Schedule	RECEIPT OF O change an offer a nce to the solicita	FFERS PRIOR TO THE Falready submitted , such cation and this amendment	HOUR AND DATE SPECIFIED MAY RESULT IN Fighange may be made by letter or electronic comm	REJECTION OF YOUR unication, provided
			CHANGES SET FORTH IN ITEM 14 ARE MADE	
	CT/ORDER IS MO H IN ITEM 14, PU	ODIFIED TO REFLECT T IRSUANT TO THE AUTH	HE ADMINISTRATIVE CHANGES (such as chang ORITY OF FAR 43.103(b).	
D. OTHER (Specify type of modification	and authority)			
X EPA-B-32-103 - LIMIT	•	GOVERNMENT'S	S OBLIGATION	
E. IMPORTANT: Contractor X is not	25.10		return copies to the iss	suing office.
14. DESCRIPTION OF AMENDMENT/MODIFICATION DUNS Number: 038086125	*			151
The purpose of this modifica	tion is	to de-obligat	te funding in the amount	of \$33,190.95 from
this task order.				
TOCOR: Melissa Puchalski				
LIST OF CHANGES:				
Reason for Modification: Fun	ding Onl	y Action		
Obligated Amount for this Mo	dificati	on: -\$33,190.	95	
New Total Obligated Amount f	or this a	Award: \$72,84	1.05	
Incremental Funded Amount ch	anged:	from		
\$106,032.00 to \$72,841.05				
CHANGES FOR LINE ITEM NUMBER	: 1			
Continued				
Except as provided herein, all terms and conditions of the	ne document refe	renced in Item 9 A or 10A	, as heretofore changed, remains unchanged and	l in full force and effect.
15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING O Michael C. Fox	FFICER (Type or print)
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
ISB. CONTINUOTOROUPPEROR		IVO. DATE SIGNED		EL FETRONIC
(Signature of paymen outhouted to sign)			Signature of Contraction Officers	07/17/2019

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NAME OF OFFEROR OR CONTRACTOR

TEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	Obligated Amount for this Modification:		口		
	-\$33,190.95				
	Incremental Funded Amount changed from				
	\$106,032.00 to \$72,841.05				
	CHANGES FOR ACCOUNTING CODE:				
	18-19-C-58D5-000A45-2505-1858DC8083-001				
	Amount changed from \$35,000.00 to \$13,971.00				
	CHANGES FOR ACCOUNTING CODE:				
	18-19-C-26CF000-000FK6XR2-2532-26A5C-1926CFE020-00				
	1				
	Amount changed from \$15,803.52 to \$3,641.57				
	Payment:				
	RTP Finance Center				
	US Environmental Protection Agency				
	RTP-Finance Center (AA216-01)				
	109 TW Alexander Drive				
	www2.epa.gov/financial/contracts				
	Durham NC 27711				
	Period of Performance: 07/09/2018 to 07/08/2019				

AMENDMENT OF SOLICITATION/MODIFIC	CATION OF CO	ONTRACT		CONTRACT ID CODE	PAGE	OF PAGES
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE	DATE	4. RI		5. PROJECT	NO. (If applicable)
P00005	See Bloo	ck 16C			2010	
6. ISSUED BY CODE			7. A	DMINISTERED BY (If other than Item 6)	CODE	
HPOD US Environmental Protection William Jefferson Clinton B 1200 Pennsylvania Avenue, N Mail Code: 3803R Washington DC 20460	uilding					
8. NAME AND ADDRESS OF CONTRACTOR (No., street	et, county, State and	ZIP Code)	(a) §	A. AMENDMENT OF SOLICITATION NO.		
WOOD ENVIRONMENT & INFRASTRUCT Attn: JOSEPH FARRELL 751 Arbor Way Ste 180 Blue Bell PA 194221972		ONS, INC.	× 1	IB. DATED (SEE ITEM 11)  OA. MODIFICATION OF CONTRACT/ORDER NOTED = WORD = 10 10 10 10 10 10 10 10 10 10 10 10 10	0.	
CODE 038086125	FACILITY COD	E		06/28/2018		
				DMENTS OF SOLICITATIONS		
separate letter or electronic communication which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by letter or electronic communication, provided each letter or electronic communication makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.  12. ACCOUNTING AND APPROPRIATION DATA (If required)  Net Decrease: -\$2,411.23  See Schedule  13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.  CHECK ONE  A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.						
B. THE ABOVE NUMBERED CONTRA appropriation data, etc.) SET FORT  C. THIS SUPPLEMENTAL AGREEMED  D. OTHER (Specify type of modification)  X EPA-B-32-103 - LIMI	NT IS ENTERED I	NTO PURSUANT TO AU	THO		n paying office	Э,
	<u> </u>					
E. IMPORTANT: Contractor Sis not  14. DESCRIPTION OF AMENDMENT/MODIFICATION DUNS Number: 038086125  The purpose of this modification	(Organized by U	ther 21 dissertation distribution is 240 cannot be	luding	solicitation/contract subject matter where feasib	le.)	.23 from
this task order.						
TOCOR: Melissa Puchalski LIST OF CHANGES: Reason for Modification: Fur Obligated Amount for this Mo New Total Obligated Amount:	odificati	on: -\$2,411.2		82		
Incremental Funded Amount ch		from	150			
\$72,841.05 to \$70,429.82						
CHANGES FOR LINE ITEM NUMBER	R: 1					
Continued						
Except as provided herein, all terms and conditions of the document referenced in Item 9 A or 10A, as heretofore changed, remains unchanged and in full force and effect.  15A. NAME AND TITLE OF SIGNER (Type or print)  16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)  Michael C. Fox						
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED		B. UNITED STATES OF AMERICA	LECTRONIC	16C. DATE SIGNED
(Signature of person authorized to sign)			1/-		S:GNATURE	03/17/2020

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NAME OF OFFEROR OR CONTRACTOR

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
(A)	(B)		(D)	(E)	(F)
	Obligated Amount for this Modification: -\$2,411.23				
	Incremental Funded Amount changed from \$72,841.05				
	to \$70,429.82				
	CHANGES FOR ACCOUNTING CODE:				
	19-20-C-26CF000-000FK8-2532-26A5C-1926CFE020-003				
	Amount changed from \$18,410.99 to \$15,999.76				
	Payment:				
	RTP Finance Center				
	US Environmental Protection Agency				
	RTP-Finance Center (AA216-01)				
	109 TW Alexander Drive				
	www2.epa.gov/financial/contracts Durham NC 27711				
	Period of Performance: 07/09/2018 to 07/08/2019				
NON 7540 04 450					ODTIONAL FORM 999 (4.99)

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2. CONTRACT N EP-W-16-	o. -015		3. AWARD/ EFFECTIVE DA 07/09/2	4. ORDER NUMBER 018 68HE0H18F15	541		5	. SOLICITATION NUM	BER	6. SOLICITATION ISSUE DATE	
	R SOLICITATION PRMATION CALL:	a.NAME Michael	V			b. TELEPHONE 202-564		(No collect calls	8. OFFE E'	ER DUE DATE/LOCAL TIME T	
9. ISSUED BY			CODE	HPOD	10. THIS ACC	UISITION IS	X UNR	ESTRICTED OR	SET ASI	IDE: % FOR:	
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TION UNLE: MARKED SEE SC	SS BLOCK IS:				RAT	S CONTRACT IS TED ORDER UN AS (15 CFR 700)	DER	14. METHOD OF SO	DLICITATION	□ RFP	
15. DELIVER TO	Ŷ	CODE	OAR/OAF	)	16. ADMINIST	TERED BY			CODE		_
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17a. CONTRACT	OR/ CODE	038086125	FACILIT			IT WILL BE MAD			CODE	RTP FMC	_
751 Arbor V Ste 180 Blue Bell P	A 194221972 (b)(4)				RTP-Fi 109 TW www2.e Durham	nance C Alexan pa.gov/ NC 277	enter der Dr financ 11	cial/contra	acts		
1/b. CHECK II	F REMIT IANCE IS DIFF	ERENT AND PUT SUCH AI	ODRESS IN OFF	ER	18b. SUBMIT		SEE ADDEN	OWN IN BLOCK 18a U IDUM	NLESS BLOC	K BELOW	
19. ITEM NO.		SCHEDUL	20. E OF SUPPLIES	SERVICES		21. QUANTITY	22. UNIT	23. UNIT PRICE		24. AMOUNT	
	Order Orde the base of reference. commence i The Contra the Attach the accept dated Apri	order is issering Proceduce ontract term. The effect: s July 9, 20 actor shall pument A State eed technical	sued in ures and dive date of the control of the co	accordance with hereby incorponditions by a for performant in accordance. Work (6 pages al and cost es a) in the amour eets as Necessary)	oorates nce to with s) and stimate						
25. ACCOUNT	ING AND APPROPRI	ATION DATA					26	. TOTAL AWARD AM	MOUNT (For	Govt. Use Only)	_
	ITATION INCORPORA			52.212-4. FAR 52.212-3 A				\$508,0	☐ ARE		
28. CONTRA COPIES TO ALL ITEMS SHEETS SU	ACTOR IS REQUIRED ISSUING OFFICE. ( SET FORTH OR OTH	O TO SIGN THIS DOCU CONTRACTOR AGREE HERWISE IDENTIFIED A MS AND CONDITIONS	IMENT AND RI S TO FURNIS ABOVE AND C	H AND DELIVER		29. AWARD DATED INCLUDING HEREIN, IS	ANY ADDIT	ACT:	ES WHICH A	OFFEF OLICITATION (BLOCK 5), RE SET FORTH	_
30b. NAME AN	ID TITLE OF SIGNER	(Type or print)		30c. DATE SIGNED		EOFCONTRA		FICER (Type or prin	ot)	31c. DATE SIGNED	

ITEM NO.   SCHEDULE OF SUPPLIES/SERVICES   QUANTITY   UNIT   UNIT PRICE	24. AMOUNT
\$508,029.00.	
This is a Time-and-Materials (T&M) task order with a total ceiling price of \$508,029.00, which	
the Contractor is not authorized to exceed. The	
Contractor exceeds at its own risk.	
The total obligated/funded ceiling amount for	
this order is currently \$501,975.52. This order	
is incrementally funded as detailed in Attachment	
B Summary of Amounts and Ceilings and Attachment	
B is hereby incorporated (1 page).	
Contracting Officer's Representative (COR) for	
this task order:	
Taylor Macy, (202) 343-9183, Macy.Taylor@epa.gov	
Alternate COR: Melissa Puchalski, (202) 343-9882,	
Puchalski.Melissa@epa.gov	
Tacharski:Merrssagepa.gov	
The services of this order are for severable.	
TOCOR: Taylor Macy	
Period of Performance: 07/09/2018 to 07/08/2019	
0001 NADP Annual Support	
Requisition No: PR-OAR-18-00507, PR-OAR-18-00545	
Accounting Info:	
Continued	
32a. QUANTITY IN COLUMN 21 HAS BEEN	
RECEIVED INSPECTED ACCEPTED, AND CONFORMS TO THE CONTRACT, EXCEPT AS NOTED:	
32b. SIGNATURE OF AUTHORIZED GOVERNMENT REPRESENTATIVE 32c. DATE 32d. PRINTED NAME AND TITLE OF AUTHORIZED GOVERNME	ENT REPRESENTATIVE
32e. MAILING ADDRESS OF AUTHORIZED GOVERNMENT REPRESENTATIVE 32f. TELEPHONE NUMBER OF AUTHORIZED GOVERNMENT RE	REPRESENTATIVE
32g. E-MAIL OF AUTHORIZED GOVERNMENT REPRESENTATIV	IVE
33. SHIP NUMBER 34. VOUCHER NUMBER 35. AMOUNT VERIFIED 36. PAYMENT 37. CHE CORRECT FOR	ECK NUMBER
PARTIAL FINAL SINAL	
38. S/R ACCOUNT NUMBER 39. S/R VOUCHER NUMBER 40. PAID BY	
41a. I CERTIFY THIS ACCOUNT IS CORRECT AND PROPER FOR PAYMENT 41b. SIGNATURE AND TITLE OF CERTIFYING OFFICER 41c. DATE	
41b. SIGNATURE AND TITLE OF CERTIFFING OFFICER  42b. RECEIVED AT (Location)	
42c. DATE REC'D (YY/MM/DD) 42d. TOTAL CONTAIN	INERS

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NAME OF OFFEROR OR CONTRACTOR

EM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	18-19-C-58D5-000A45-2505 BFY: 18 EFY: 19 Fund: C				
	Budget Org: 58D5 Program (PRC): 000A45 Budget				
	(BOC): 2505 Funding Flag: Partial				
	Funded: \$0.00				
	Accounting Info:				
	18-19-C-58D5-000A45-2505-1858DC8027-001 BFY: 18				
	EFY: 19 Fund: C Budget Org: 58D5 Program (PRC):				
	000A45 Budget (BOC): 2505 DCN - Line ID: 1858DC8027-001				
	Funding Flag: Partial				
	Funded: \$501,975.52				

#### **ATTACHEMENT A**

Statement of Work

Title: NADP Annual Support

Contract #: EP-W-16-015

**Project #:** 2014

**Period of Performance:** 7/9/2018 to 7/8/2019

# **EPA Key Personnel**

# Task Order Project Officer (TOPO)/Contract Level Project Officer (PO):

Taylor Macy

Clean Air Markets Division (OAP/OAR/CAMD)

1200 Pennsylvania Ave., NW

Mail Code 6204M

Washington, DC 20460

phone: (202) 343-9183

email: macy.taylor@epa.gov

#### **Alternate TOPO:**

Melissa Puchalski

Clean Air Markets Division (OAP/OAR/CAMD)

1200 Pennsylvania Ave., NW

Mail Code 6204M

Washington, DC 20460

phone: (202) 343-9882

email: puchalski.melissa@epa.gov

# **Contracting Officer (CO):**

Michael Fox

Contracting Officer

Administrative Contract Service Center

1200 Pennsylvania Ave N.W.

Mail Code 3803R

Washington DC 20460

phone: (202) 564-2550

email: fox.michael@epa.gov

#### STATEMENT OF WORK

#### I. INTRODUCTION

The Clean Air Status and Trends Network (CASTNET) is a long-term environmental monitoring network that measures changes in ambient air quality and assesses atmospheric deposition over broad geographic regions of the U.S. (<a href="https://www.epa.gov/castnet">https://www.epa.gov/castnet</a>). Operating since 1987, CASTNET has evolved into a robust regional monitoring program which currently consists of approximately 95 monitoring stations nationwide. The Environmental Protection Agency (EPA) coordinates the operation of the network in cooperation with numerous federal, tribal, state and local partners.

The primary monitoring objectives of CASTNET are to:

- Provide high quality data on atmospheric deposition, rural ground level ozone and other forms of atmospheric pollution;
- Support the primary and secondary ozone NAAQS and provide data on NAAQS compliance in rural
  areas;
- Monitor the status and trends in regional air quality and atmospheric deposition;
- Assess and report on geographic patterns and long-term, temporal trends in ambient air pollution and atmospheric deposition;
- Improve our understanding of PM and ozone formation;
- Validate and improve atmospheric models;
- Provide data for health-based research and epidemiology studies;
- Assess the effectiveness of EPA's emission reduction programs; and
- Support science and ecosystem studies.

CASTNET sites measure weekly average concentrations of sulfate (SO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>), sulfur dioxide (SO<sub>2</sub>), nitric acid (HNO<sub>3</sub>), chloride (Cl<sup>-</sup>) and the base cations (Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>and Ca<sup>2+</sup>) using a 3-stage filter pack. In addition, each site may make ancillary measurements, including hourly ozone (O<sub>3</sub>), hourly meteorology, ammonia (NH<sub>3</sub>) gas using passive devices, and trace-level gases. Trace-level gas monitors include reactive oxidized nitrogen (NOy), nitric oxide (NO), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO). CASTNET O<sub>3</sub>, meteorological, and trace gas measurements follow the requirements in the Code of Federal Regulations (CFR) and EPA's Quality Assurance Handbook.

# II. PURPOSE

The primary purpose of this task order is to provide support for the National Atmospheric Deposition Program's (NADP's) network operations and site support. This includes EPA/CAMDs support for analytical chemistry, quality assurance and network equipment services provided by the University of Wisconsin's Hygiene Laboratory.

#### III. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this task order are consistent with the activities authorized in CLIN 22 of the contract's Statement of Work.

#### IV. TECHNICAL DIRECTION

# 1. Prepare a Technical Proposal & Cost Estimate

The Contractor shall prepare a Task Order Proposal in accordance with the terms and conditions of contract clauses B.2 entitled Fixed Rates for Services – Indefinite delivery/Indefinite quantity contract.

# 2. NADP Participation

The contractor shall coordinate with NADP's Program Office (PO) and Central Analytical Laboratory to provide chemical and analytical, data validation, and site support services for all NADP's NTN, AMoN, and AMNet sites listed in Table 3 which are supported by the US EPA's Clean Air Markets Division. EPA CAMD supports the chemical analysis, data validation, network equipment depot, and PO coordination for 32 NTN sites; chemical analysis and PO coordination of 70 AMoN sites; and PO coordination of 2 AMNet sites.

The contractor shall coordinate with NADP's PO to provide quality assurance services for NTN and AMNet to ensure conformance with NADP's network quality assurance plans and procedures for field and laboratory operations and data management.

The contractor shall coordinate with NADP's Program Office to provide support for use of Parameter-elevation Regressions on Independent Slopes *Model (PRISM)*, which produces digital grids of precipitation estimates from many precipitation-monitoring networks.

Table 3. NADP NTN, AMoN, and AMNet sites supported by USEPA Clean Air Markets Division

NTN Site ID	Site Name
AL99	Sand Mountain Ag Exp Station
AZ98	Chiricahua
CO08	Four Mile Park
CO10	Gothic
CO92	Sunlight Peak
CO94	Sugarloaf
CT15	Abington
FL03	Bradford Forest
FL23	Sumatra
GA20	Bellville
IL11	Bondville
IL46	Alhambra
ME04	Carrabassett Valley
MI51	Unionville
MI52	Ann Arbor
MI98	Raco
MN18	Fernberg
NC06	Beaufort
NJ39	Cattus Island County Park
NJ99	Washington Crossing
NY22	Akwesasne Mohawk - Fort Covington
NY52	Bennett Bridge
OH54	Deer Creek State Park
OR97	Hyslop Farm

PA00	Arendtsville
TN04 Speedwell	
VA13	Horton's Station
VA24	Prince Edward
WA21	LaGrande
WI35	Perkinstown
WV05 NY67	Cedar Creek State Park Connecticut Hill

AMoN Site ID	Site Name
AL99	Sand Mt Research & Extension Ctr
AR03	Caddo Valley
CO10	Gothic
CO13	Fort Collins
CT15	Abington
FL19	Indian River
FL23	Sumatra
GA41	Georgia Station
ID07	Nez Pearce
IL11	Bondville (3 and 1)
IL37	Stockton
IL46	Alhambra
IN20	Roush Lake
IN22	SW Purdue Ag Center )
IN99	Indianapolis
KS31	Konza Prairie
KS97	Kickapoo Tribe - Powhattan
KY03	Mackville
KY29	Crockett
KY98	Cadiz
MD06	Blackwater NWR
ME93	Ashland
MI51	Unionville
MI52	Ann Arbor
MI95	Hoxeyville
MI96	Detroit
MN18	Fernberg (3 and 1)
MN02	Red Lake
MS30	Coffeeville
NC02	Cranberry
NC06	Carteret
NC25	Coweeta
NC26	Candor
NC30	Duke Forest

NC35	Clinton Crops Research Station
NE98	Santee
NH02	Hubbard Brook
NJ98	Washington Crossing- CASTNET
NM98	Navajo Lake
NM99	Farmington
NY20	Huntington Wildlife
NY67	Ithaca (3 and 1)
NY91	Claryville
NY94	Nick's Lake
NY98	Whiteface Mountain
OH02	Athens
OH09	Oxford
OH27	Cincinnati
OH54	Deer Creek State Park
OH99	Quaker City
OK99	Stilwell
PA00	Arendtsville
PA29	Kane Experimental Forest
PA96	Penn State - Fairbrook Park
PA56	M. K. Goddard
PA97	Laurel Hill
SC05	Cape Romain National Wildlife Refuge
TN04	Speedwell
TN07	Edgar Evins
TX41	Alabama-Coushatta
TX43	Canonceta
VA13	Horton's Station
VA24	Prince Edward
VT99	Underhill
WI07	Mayville
WI35	Perkinstown
WV05	Cedar Creek State Park
WV18	Parsons
WY06	Pinedale
WY95	Brooklyn Lake

AMNet Site ID	Site Name
NJ30	New Brunswick
NJ54	Elizabeth Lab

# V. DELIVERABLES AND SCHEDULE

# 1. Technical Proposal & Cost Estimate

The contractor shall deliver a Task Order Proposal and cost estimate in accordance with clause B.7 Task Order Ordering Procedures of the contract. The proposal shall be submitted 10 days after receipt of the SOW.

# 2. Monthly Progress Report

The contractor shall prepare and submit a monthly progress report by the 15<sup>th</sup> of each month summarizing the progress made, issues encountered or expected, work planned for the next reporting period and costs. These reports shall comply with contract clauses F.1 Monthly Progress Report and F-5 Reports of work. Reports shall be delivered electronically.

# **Distribution of Deliverables:**

Addressee	Copies
EPA Contracting Officer (Mike Fox)	1
EPA Task Order Project Officer (Taylor Macy)	1
EPA Alternate TOPO (Melissa Puchalski)	1

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts							
Period	Previous Amount	This Action	Amount				
Base Period		\$501,975.52	\$501,975.52				
Total		\$501,975.52	\$501,975.52				

Total Task Order Ceiling						
Period	Previous Amount	This Action	Amount			
Base Period	-	\$508,029.00	\$508,029.00			
Total	-	\$508,029.00	\$508,029.00			

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

AMENDMENT OF SO	LICITATION/MODIFICA	ATION OF CO	ONTRACT		1. CONTRACT ID CODE	PAGE	OF PAGES
2. AMENDMENT/MODIFICA	ATION NO.	3. EFFECTIVE	DATE	4. REQ	 UISITION/PURCHASE REQ. NO.	5. PROJECT	ΠΟ. (If applicable)
P00001		See Bloo	ck 16C	PR-0	AR-19-00494	EP-W-1	6-015
6. ISSUED BY	CODE	HPOD		7. ADN	MINISTERED BY (If other than Item 6)	CODE	
William Jeffer		ilding				_	
TO SECOND	F CONTRACTOR (No., street,	, county, State and	ZIP Code)	(v) 9A.	AMENDMENT OF SOLICITATION NO.		
WOOD ENVIRONMEN Attn: JOSEPH FARRE 751 Arbor Way Ste 180 Blue Bell PA 19422197	NT & INFRASTRUCTU		ONS, INC.	9B. × 10A E.E.	DATED (SEE ITEM 11)  A. MODIFICATION OF CONTRACT/ORDER NOTE: $0.00000000000000000000000000000000000$	0.	
CODE 038086125	<u> </u>	FACILITY COD	E	0	6/28/2018		
	<del>-</del>	11. THIS ITE	M ONLY APPLIES TO A		ENTS OF SOLICITATIONS		
Items 8 and 15, and retur separate letter or electror RECEIVED AT THE PLAC OFFER. If by virtue of thi	ning cop nic communication which incl CE DESIGNATED FOR THE is amendment you desire to d	oies of the amen udes a reference RECEIPT OF O change an offer a	dment; (b) By acknowled to the solicitation and ar FFERS PRIOR TO THE laready submitted, such	ging red nendme HOUR A change	on or as amended, by one of the following met eipt of this amendment on each copy of the off nt numbers. FAILURE OF YOUR ACKNOWL IND DATE SPECIFIED MAY RESULT IN REJE may be made by letter or electronic communic	fer submitted; EDGEMENT CTION OF Yeation, provided	or (c) By TO BE OUR
NAMES OF THE PERSON OF THE PER	ommunication makes referer PROPRIATION DATA (If requ	12 029	10/2011	- man - man	received prior to the opening hour and date sp		
See Schedule			Nec	THE	rease: \$8	3,553.8	J
B. THE ABO appropria		CT/ORDER IS MO	ODIFIED TO REFLECT 1 PRSUANT TO THE AUTH	THE ADI	ES SET FORTH IN ITEM 14 ARE MADE IN TI MINISTRATIVE CHANGES (such as changes in OF FAR 43.103(b).		
D. OTHER	(Specify type of modification	and authority)					
X Mutual	Agreement of	the Part	ies				
E. IMPORTANT: Contra	ctor X is not	is required t	o sign this document and	return	copies to the issuing	g office.	
	NDMENT/MODIFICATION (0 38086125	Organized by UC	F section headings, inclu	iding so	licitation/contract subject matter where feasible	э.)	
with Attachment proposal dated \$2,659.00 from	A, Revised St March 28, 2019 \$508,029.00 to	atement (8 page \$510,68	of Work (6 p s). The tota 8.00. This o	ages l pr rder	e revised statement of ) and the revised techn ice of this task order is incrementally funde chment B is hereby inco	ical ar is beir d as de	nd cost ng increased by etailed in
Continued							
Except as provided herein, a  15A. NAME AND TITLE OF	V 10 10 10 10 10 10 10 10 10 10 10 10 10	document refere	enced in Item 9 A or 10A,	16A. I	tofore changed, remains unchanged and in ful NAME AND TITLE OF CONTRACTING OFFIC hael C. Fox		
15B. CONTRACTOR/OFFE	ROR		15C. DATE SIGNED	16B. I	JNITED STATES OF AMERICA	L FETRONIC S:GNATURE	
(Signature of pe	erson authorized to sign)	======================================			(Signature of Contracting Officer)	<u> </u>	03/20/2013

CONTINUATION SHEET

REFERENCE NO. OF DOCUMENT BEING CONTINUED EP-W-16-015/68HE0H18F1541/P00001

PAGE 2 OF 3

NAME OF OFFEROR OR CONTRACTOR

NO.	SUPPLIES/SERVICES	QUANTITY		UNIT PRICE	AMOUNT
.)	(B)	(C)	(D)	(E)	(F)
	mbis is a miss and Mataviala (mcM) took and				
	This is a Time-and-Materials (T&M) task order				
	with a total ceiling price of \$510,688.00, which				
	the Contractor is not authorized to exceed. The				
	Contractor exceeds at its own risk.				
	The total obligated/funded ceiling amount for				
	this order is currently \$510,529.37. This order				
	is incrementally funded as detailed in Attachment				
	B Summary of Amounts and Ceilings and Attachment				
	B is hereby incorporated (1 page).				
	Is hereby incorporated (1 page).				
	TOCOR: Taylor Macy				
	LIST OF CHANGES:				
	Reason for Modification: Funding Only Action				
	Total Amount for this Modification: \$2,659.00				
	New Total Amount for this Version: \$510,688.00				
	New Total Amount for this Award: \$510,688.00				
	Obligated Amount for this Modification: \$8,553.85				
	Nov. Total Obligated Amount for this Award.				
	New Total Obligated Amount for this Award:				
	\$510,529.37				
	Incremental Funded Amount changed: from				
	\$501,975.52 to \$510,529.37				
	CHANGES FOR LINE ITEM NUMBER: 1				
	Total Amount changed				
	from \$508,029.00 to \$510,688.00				
	Obligated Amount for this Modification: \$8,553.85				
	Incremental Funded Amount changed from				
	\$501,975.52 to \$510,529.37				
	FOB changed from Destination to				
	NEW ACCOUNTING CODE ADDED:				
	Account code:				
	19-20-C-58D5-000A45-2505-1958DC9032-001 Beginning				
	FiscalYear 19				
	Ending Fiscal Year 20				
	Fund (Appropriation) C				
	Budget Organization 58D5				
	Program (PRC) 000A45				
	Budget (BOC) 2505				
	Job # (Site/Project)				
	Cost Organization				
	DCN-LineID 1958DC9032-001				
	Amount: \$8,553.85				
	Subject To Funding: N				
	Payment Address:				
	Continued				

 CONTINUATION SHEET
 REFERENCE NO. OF DOCUMENT BEING CONTINUED
 PAGE
 OF

 EP-W-16-015/68HE0H18F1541/P00001
 3
 3

NAME OF OFFEROR OR CONTRACTOR

ITEM NO.	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	AMOUNT (F)
	RTP Finance Center US Environmental Protection Agency RTP-Finance Center (AA216-01) 109 TW Alexander Drive www2.epa.gov/financial/contracts Durham NC 27711			
	Payment:  RTP Finance Center  US Environmental Protection Agency  RTP-Finance Center (AA216-01)  109 TW Alexander Drive  www2.epa.gov/financial/contracts  Durham NC 27711  Period of Performance: 07/09/2018 to 07/08/2019			

# **ATTACHMENT A**

Title: NADP Annual Support (2014)

**Contractor:** Wood Environment & Infrastructure Solutions, Inc.

 Contract #:
 EP-W-16-015

 Task Order #:
 68HE0H18F1541

 Period of Performance:
 7/9/2018 to 7/8/2019

# **EPA Key Personnel**

# Task Order Project Officer (TOPO)/Contract Level Project Officer (PO):

**Taylor Macy** 

Clean Air Markets Division (OAP/OAR/CAMD)

1200 Pennsylvania Ave., NW

Mail Code 6204M

Washington, DC 20460

phone: (202) 343-9183

email: macy.taylor@epa.gov

#### **Alternate TOPO:**

Melissa Puchalski

Clean Air Markets Division (OAP/OAR/CAMD)

1200 Pennsylvania Ave., NW

Mail Code 6204M

Washington, DC 20460

phone: (202) 343-9882

email: puchalski.melissa@epa.gov

# **Contracting Officer (CO):**

Michael Fox

**Contracting Officer** 

Administrative Contract Service Center

1200 Pennsylvania Ave N.W.

Mail Code 3803R

Washington DC 20460

phone: (202) 564-2550

email: fox.michael@epa.gov

<sup>\*</sup>Modification #1, changes highlighted in yellow.

# STATEMENT OF WORK (revised 3-21-2019)

#### I. INTRODUCTION

The Clean Air Status and Trends Network (CASTNET) is a long-term environmental monitoring network that measures changes in ambient air quality and assesses atmospheric deposition over broad geographic regions of the U.S. (<a href="https://www.epa.gov/castnet">https://www.epa.gov/castnet</a>). Operating since 1987, CASTNET has evolved into a robust regional monitoring program which currently consists of approximately 95 monitoring stations nationwide. The Environmental Protection Agency (EPA) coordinates the operation of the network in cooperation with numerous federal, tribal, state and local partners.

The primary monitoring objectives of CASTNET are to:

- Provide high quality data on atmospheric deposition, rural ground level ozone and other forms of atmospheric pollution;
- Support the primary and secondary ozone NAAQS and provide data on NAAQS compliance in rural areas:
- Monitor the status and trends in regional air quality and atmospheric deposition;
- Assess and report on geographic patterns and long-term, temporal trends in ambient air pollution and atmospheric deposition;
- Improve our understanding of PM and ozone formation;
- Validate and improve atmospheric models;
- Provide data for health-based research and epidemiology studies;
- Assess the effectiveness of EPA's emission reduction programs; and
- Support science and ecosystem studies.

CASTNET sites measure weekly average concentrations of sulfate (SO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>), sulfur dioxide (SO<sub>2</sub>), nitric acid (HNO<sub>3</sub>), chloride (Cl<sup>-</sup>) and the base cations (Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup> and Ca<sup>2+</sup>) using a 3-stage filter pack. In addition, each site may make ancillary measurements, including hourly ozone (O<sub>3</sub>), hourly meteorology, ammonia (NH<sub>3</sub>) gas using passive devices, and trace-level gases. Trace-level gas monitors include reactive oxidized nitrogen (NOy), nitric oxide (NO), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO). CASTNET O<sub>3</sub>, meteorological, and trace gas measurements follow the requirements in the Code of Federal Regulations (CFR) and EPA's Quality Assurance Handbook.

#### II. PURPOSE

The primary purpose of this task order is to provide support for the National Atmospheric Deposition Program's (NADP's) network operations and site support. This includes EPA's Clean Air Markets Division (CAMD) support for analytical chemistry, quality assurance (QA), and network equipment services provided by the Wisconsin State Laboratory of Hygiene (WSLH) for NADP.

#### III. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this task order are consistent with the activities authorized in Task 22(Level of Effort) from the contract's Statement of Work.

#### IV. TECHNICAL DIRECTION

# 1. Prepare a Technical Proposal & Cost Estimate

The Contractor shall prepare a Technical Proposal and Cost Estimate in accordance with the terms and conditions of contract clauses B.1 entitled Fixed Rates for Services – Indefinite delivery/Indefinite quantity contract.

# 2. NADP Participation

The contractor shall coordinate with NADP's Program Office (PO) and Central Analytical Laboratory to provide chemical and analytical, data validation, and site support services for all NADP's National Trends Network (NTN), Ammonia Monitoring Network (AMoN), and Atmospheric Mercury Network (AMNet) sites listed in Tables 1, 2, and 3, respectively. EPA's CAMD supports the chemical analysis, data validation, network equipment depot, and PO coordination for 32 NTN sites; chemical analysis and PO coordination of 71 AMoN sites; and PO coordination of 2 AMNet sites. This modified SOW includes the addition of the Duke Forest Flux Tower AMoN site (NC98).

The contractor shall coordinate with NADP's PO to provide quality assurance services for NTN and AMNet to ensure conformance with NADP's network quality assurance plans and procedures for field and laboratory operations and data management.

The contractor shall coordinate with NADP's Program Office to provide support for use of Parameter-elevation Regressions on Independent Slopes *Model (PRISM)*, which produces digital grids of precipitation estimates from many precipitation-monitoring networks.

Table 1 NADP's NTN sites supported by EPA's CAMD

NTN Site ID	Site Name
AL99	Sand Mountain Ag Exp Station
AZ98	Chiricahua
CO08	Four Mile Park
CO10	Gothic
CO92	Sunlight Peak
CO94	Sugarloaf
CT15	Abington
FL03	Bradford Forest
FL23	Sumatra
GA20	Bellville
IL11	Bondville
IL46	Alhambra
ME04	Carrabassett Valley
MI51	Unionville
MI52	Ann Arbor
MI98	Raco
MN18	Fernberg
NC06	Beaufort
NJ39	Cattus Island County Park

NJ99	Washington Crossing
NY22	Akwesasne Mohawk - Fort Covington
NY52	Bennett Bridge
NY67	Connecticut Hill
OH54	Deer Creek State Park
OR97	Hyslop Farm
PA00	Arendtsville
TN04	Speedwell
VA13	Horton's Station
VA24	Prince Edward
WA21	LaGrande
WI35	Perkinstown
WV05	Cedar Creek State Park

Table 2 NADP AMoN sites supported by EPA's CAMD

AMoN Site ID	Site Name
AL99	Sand Mt Research & Extension Ctr
AR03	Caddo Valley
CO10	Gothic
CO13	Fort Collins
CT15	Abington
FL19	Indian River
FL23	Sumatra
GA41	Georgia Station
ID07	Nez Pearce
IL11	Bondville (3 and 1)
IL37	Stockton
IL46	Alhambra
IN20	Roush Lake
IN22	SW Purdue Ag Center )
IN99	Indianapolis
KS31	Konza Prairie
KS97	Kickapoo Tribe - Powhattan
KY03	Mackville
KY29	Crockett
KY98	Cadiz
MD06	Blackwater NWR
ME93	Ashland
MI51	Unionville
MI52	Ann Arbor
MI95	Hoxeyville
MI96	Detroit
MN18	Fernberg (3 and 1)
MN02	Red Lake
MS30	Coffeeville
NC02	Cranberry

NC06	Carteret
NC25	Coweeta
NC26	Candor
NC30	Duke Forest
NC35	Clinton Crops Research Station
NC98	Duke Forest Flux Tower
NE98	Santee
NH02	Hubbard Brook
NJ98	Washington Crossing- CASTNET
NM98	Navajo Lake
NM99	Farmington
NY20	Huntington Wildlife
NY67	Ithaca (3 and 1)
NY91	Claryville
NY94	Nick's Lake
NY98	Whiteface Mountain
OH02	Athens
OH09	Oxford
OH27	Cincinnati
OH54	Deer Creek State Park
OH99	Quaker City
OK99	Stilwell
PA00	Arendtsville
PA29	Kane Experimental Forest
PA96	Penn State - Fairbrook Park
PA56	M. K. Goddard
PA97	Laurel Hill
SC05	Cape Romain National Wildlife Refuge
TN04	Speedwell
TN07	Edgar Evins
TX41	Alabama-Coushatta
TX43	Canonceta
VA13	Horton's Station
VA24	Prince Edward
VT99	Underhill
WI07	Mayville
WI35	Perkinstown
WV05	Cedar Creek State Park
WV18	Parsons
WY06	Pinedale
WY95	Brooklyn Lake

Table 3 NADP's AMNet sites supported by EPA's CAMD

AMNet Site ID	Site Name
NJ30	New Brunswick
NJ54	Elizabeth Lab

#### V. DELIVERABLES AND SCHEDULE

# 1. Technical Proposal & Cost Estimate

The contractor shall deliver a Task Order Proposal and cost estimate in accordance with clause B.7 Task Order Ordering Procedures of the contract. The proposal shall be submitted 10 days after receipt of the SOW.

# 2. Monthly Progress Report

The contractor shall prepare and submit a monthly progress report by the 15<sup>th</sup> of each month summarizing the progress made, issues encountered or expected, work planned for the next reporting period and costs. These reports shall comply with contract clauses F.1 Monthly Progress Report and F-5 Reports of work. Reports shall be delivered electronically.

#### **Distribution of Deliverables:**

Addressee	Copies
EPA Contracting Officer (Mike Fox)	1
EPA Task Order Project Officer (Taylor Macy)	1
EPA Alternate TOPO (Melissa Puchalski)	1

EP-W-16-015

Order#: 68HE0H18F1541

Project#: 2014 Mod#: P00001

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts								
Period Previous Amount This Action Amount								
Base Period	\$501,975.52	\$8,553.85	\$510,529.37					
Total	\$501,975.52	\$8,553.85	\$510,529.37					

Total Task Order Ceiling								
Period Previous Amount This Action A								
Base Period	\$508,029.00	\$2,659.00	\$510,688.00					
Total	\$508,029.00	\$2,659.00	\$510,688.00					

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT					CONTRACT ID CODE	PAGE	OF PAGES					
2. AMENDMEN	NT/MODIFICATION NO.	3. EFFECTIVE I	DATE	4. R		5. PROJECT	NO. (If applicable)					
P00002		See Bloc	k 16C			2014						
6. ISSUED BY	CODE	HQAD		7. <i>F</i>	ADMINISTERED BY (If other than Item 6)	CODE						
William 1200 Per Mail Coo	ronmental Protection Jefferson Clinton Bu nnsylvania Avenue, N. de: 3803R ton DC 20460	ilding										
	ACTUAL VIEW ACTUAL ACTU	, county, State and 2	IP Code)	(5)	9A. AMENDMENT OF SOLICITATION NO.		<del></del>					
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)  WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.  Attn: JOSEPH FARRELL  751 Arbor Way  Ste 180  Blue Bell PA 194221972					9B. DATED (SEE ITEM 11)  ** 10A. MODIFICATION OF CONTRACT/ORDER NO. EP-W-16-015 68HE0H18F1541							
CODE 03		FACILITY CODE			10B. DATED (SEE ITEM 13) 06/28/2018							
	0006123			MEN	DMENTS OF SOLICITATIONS							
Items 8 and separate lett RECEIVED A OFFER. If beach letter o	15, and returning coper or electronic communication which includes THE PLACE DESIGNATED FOR THE by virtue of this amendment you desire to or electronic communication makes referenced and APPROPRIATION DATA (If required).	oies of the amend udes a reference RECEIPT OF OF change an offer al nce to the solicitat	ment; (b) By acknowled to the solicitation and ar FERS PRIOR TO THE ready submitted, such ion and this amendmen	dging mend HOU chan t, and	tation or as amended , by one of the following met receipt of this amendment on each copy of the off ment numbers. FAILURE OF YOUR ACKNOWL R AND DATE SPECIFIED MAY RESULT IN REJE ge may be made by letter or electronic communicatis received prior to the opening hour and date specrease:	fer submitted; EDGEMENT T ECTION OF YO ation, provided	or (c) By O BE DUR					
	13. THIS ITEM ONLY APPLIES TO M	ODIFICATION OF	CONTRACTS/ORDERS	s. IT	MODIFIES THE CONTRACT/ORDER NO. AS DE	SCRIBED IN IT	EM 14.					
CHECK ONE	N N N N N N N N N N N N N N N N N N N	CT/ORDER IS MC I IN ITEM 14, PUI	DDIFIED TO REFLECT 1 RSUANT TO THE AUTH	THE /	NGES SET FORTH IN ITEM 14 ARE MADE IN THE ADMINISTRATIVE CHANGES (such as changes in TY OF FAR 43.103(b).  PRITY OF:							
	D. OTHER (Specify type of modification	***										
X	EPA-B-32-103 - LIMIT	pC.3d										
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Continue												
Except as provided herein, all terms and conditions of the document referenced in Item 9 A or 10A, as heretofore changed, remains unchanged and in full force and effect.  15A. NAME AND TITLE OF SIGNER (Type or print)  16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)  Michael C. Fox												
15B. CONTRA	CTOR/OFFEROR		15C. DATE SIGNED			L FETRONIC S:GNATURE	16C. DATE SIGNED 10/16/2019					
	(Signature of person authorized to sign)			1	(Signature of Contracting Officer)							

 CONTINUATION SHEET
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 OF

 EP-W-16-015/68HE0H18F1541/P00002
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NAME OF OFFEROR OR CONTRACTOR

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
(A)	(B)		(D)	(E)	(F)
	CHANGES FOR LINE ITEM NUMBER: 1				150 · 8
	Obligated Amount for this Modification: -\$2,522.37				
	Incremental Funded Amount changed from				
	\$510,529.37 to \$508,007.00				
	CHANGES FOR ACCOUNTING CODE:				
	19-20-C-58D5-000A45-2505-1958DC9032-001				
	Amount changed from \$8,553.85 to \$6,031.48				
	Payment:				
	RTP Finance Center				
	US Environmental Protection Agency				
	RTP-Finance Center (AA216-01)				
	109 TW Alexander Drive				
	www2.epa.gov/financial/contracts				
	Durham NC 27711				
	Period of Performance: 07/09/2018 to 07/08/2019				
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SOLICITATION/CONTRACT/ORDER FOR COMMERCIAL ITEMS					1. REQUISITION NUMBER PAGE OF PR-0AR-18-01069 1 3						
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2. CONTRACT NO. EP-W-16-0	015		3. AWARD/ EFFECTIVE DA 07/25/2	THE RESIDENCE STREET, AND ASSOCIATED SHOW	43			. SOLICITATION NU	v. Color (Selv) fr set	6. SOLICITATION ISSUE DATE	
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9. ISSUED BY			CODE	HPOD	10. THIS ACQ	UISITION IS	X UNF	RESTRICTED OR	SET ASIDE	:: % FOR:	
HPOD US Environmental Protection Agency William Jefferson Clinton Building 1200 Pennsylvania Avenue, N. W. Mail Code: 3803R Washington DC 20460					SMALL BUSINESS  □ HUBZONE SMALL BUSINESS □ HUBZONE SMALL BUSINESS □ EDWOSB □ SERVICE-DISABLED VETERAN-OWNED SMALL BUSINESS □ S(A) SIZE STANDARD: \$15.						
11. DELIVERY FO		12. DISCOUNT TERMS			□ 42- TU	S CONTRACT IS		13b. RATING			
MARKED  SEE SCHE					RAT	ED ORDER UNI S (15 CFR 700)	DER	14. METHOD OF S		RFP	
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17b. CHECK IF F	REMITTANCE IS DIFF	ERENT AND PUT SUCH	ADDRESS IN OFF	ER	18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW IS CHECKED □SEE ADDENDUM						
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25. ACCOUNTIN See Sched	Handling S This task Order Orde the base of reference of commence of The Contra (Use Re UG AND APPROPR dule	er: 0380861  oplemental I  Support for  order is is  ering Procect  contract ter  . The effect  is July 25,  actor shall  overse and/or Attach  lation DATA	Caborator CSN ssued in dures and coive date 2018. perform additional Sh	accordance with hereby incorperonditions by a for performantion accordance	orates ce to with		256	S. TOTAL AWARD A \$107,	MOUNT (For G. 796.00	ovt. Use Only)	
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19. ITEM NO.		20. SCHEDULE OF SUPPLIE:	S/SERVICES	5		21. QUANTITY	22. UNIT	23. UNIT PI		24. AMOUNT
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	the accepte	ed technical propo	sal a	nd cost esti	mate					
	dated July 12, 2018 (7 pages) in the amount of									
	\$107,796.00	ο.								
	This is a Time-and-Materials (T&M) task order									
	with a tota	al ceiling price c	f \$10	7,796.00, wh	ich					
	the Contrac	ctor is not author	ized	to exceed. T	he					
	Contractor	exceeds at its ow	n ris	k.						
		obligated/funded o		_						
		is currently \$107								
		ntally funded as d								
		of Amounts and Cei			lent					
	B is hereby	y incorporated (1	page)	*						
	Contracting	g Officer's Repres	entat:	ive (COR) fo	r					
	this task of	order:								
	Joann Rice,	, (919)541-3372, R	ice.J	oann@epa.gov						
	Alternate (									
		s, (919)541 <b>-</b> 2262,								
	Landis.Eliz	zabeth@epa.gov								
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		es of this order a	re fo	r severable.						
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NAME OF OFFEROR OR CONTRACTOR

TEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT	UNIT PRICE (E)	AMOUNT (F)
	Support for CSN				
	Accounting Info: 18-E1-53GS-000A04XPM-4183-1853PM8084-001 BFY: 18 Fund: E1 Budget Org: 53GS Program (PRC): 000A04XPM Budget (BOC): 4183 DCN - Line ID:				
	1853PM8084-001 Funding Flag: Complete Funded: \$107,794.56				

# ATTACHMENT A Statement of Work

**Title:** Supplemental Laboratory and Filter Handling Support for CSN

**Contractor:** Amec Foster Wheeler

**Contract #:** EP-W-16-015

**Project #:** 2013

**Period of Performance:** 7/25/2018 to 7/08/2019

# **EPA Key Personnel**

# Task Order Project Officer (TOPO)/Contract Level Project Officer (PO):

Joann Rice

Air Quality Assessment Division (OAR/OAQPS/AQAD)

Mail Drop C304-06

Research Triangle Park, NC 27711

Phone: (919) 541-3372 Email: rice.joann@epa.gov

# **Alternate TOPO:**

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Air Quality Assessment Division (OAR/OAQPS/AQAD)

Mail Drop C304-06

Research Triangle Park, NC 27711

phone: (919) 541-2262 email: trinca.laurie@epa.gov

# **Contracting Officer (CO):**

Mike Fox

Contracting Officer

Administrative Contract Service Center

1200 Pennsylvania Ave N.W.

Mail Code 3803R

Washington DC 20460

phone: (202) 564-2550

email: fox.michael@epa.gov

#### STATEMENT OF WORK

#### I. INTRODUCTION

The Clean Air Status and Trends Network (CASTNET) is a long-term environmental monitoring network that measures changes in ambient air quality and assesses atmospheric deposition over broad geographic regions of the U.S. (<a href="https://www.epa.gov/castnet">https://www.epa.gov/castnet</a>). Operating since 1987, CASTNET has evolved into a robust regional monitoring program which currently consists of approximately 95 monitoring stations nationwide. The Environmental Protection Agency (EPA) coordinates the operation of the network in cooperation with numerous federal, tribal, state and local partners.

The primary monitoring objectives of CASTNET are to:

- Provide high quality data on atmospheric deposition, rural ground level ozone and other forms of atmospheric pollution;
- Support the primary and secondary ozone NAAQS and provide data on NAAQS compliance in rural areas;
- Monitor the status and trends in regional air quality and atmospheric deposition;
- Assess and report on geographic patterns and long-term, temporal trends in ambient air pollution and atmospheric deposition;
- Improve our understanding of PM and ozone formation;
- Validate and improve atmospheric models;
- Provide data for health-based research and epidemiology studies;
- Assess the effectiveness of EPA's emission reduction programs; and
- Support science and ecosystem studies.

CASTNET sites measure weekly average concentrations of sulfate (SO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>), sulfur dioxide (SO<sub>2</sub>), nitric acid (HNO<sub>3</sub>), chloride (Cl<sup>-</sup>) and the base cations (Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>and Ca<sup>2+</sup>) using a 3-stage filter pack. In addition, each site may make ancillary measurements, including hourly ozone (O<sub>3</sub>), hourly meteorology, ammonia (NH<sub>3</sub>) gas using passive devices, and trace-level gases. Trace-level gas monitors include reactive oxidized nitrogen (NOy), nitric oxide (NO), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO). CASTNET O<sub>3</sub>, meteorological, and trace gas measurements follow the requirements in the Code of Federal Regulations (CFR) and EPA's Quality Assurance Handbook.

# II. PURPOSE

The primary purpose of this task order is to pre-wash nylon filters for the Chemical Speciation Network (CSN), conduct acceptance testing, and support a 25mm Teflon filter study. Once the filters have been washed and pass the CSN acceptance testing criteria, they will be shipped to Wood PLC (formerly Amec Foster Wheeler) for use in the routine network, which functions under a contract between Wood PLC and EPA's OAQPS. For the 25mm Teflon filter study, Wood PLC will be responsible for inserting 25mm filter holders and 25mm Teflon filters into the MetOne SASS/SuperSASS stainless steel modules for sample collection. The Task Order Project Officer shall provide technical direction for performance of specific tasks under this task order.

#### III. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this task order are consistent with the activities authorized in CLIN 22 of the contract's Statement of Work.

#### IV. TECHNICAL DIRECTION

# 1. Prepare a Technical Proposal & Cost Estimate

The Contractor shall prepare a Task Order Proposal in accordance with the terms and conditions of contract clauses B.2 entitled Fixed Rates for Services – Indefinite delivery/Indefinite quantity contract.

# 2. Pre-wash and acceptance test the Chemical Special Network (CSN) Nylon Filters

The Contractor shall prewash and acceptance test nylon filters for the Chemical Speciation Network. Wood PLC (formerly Amec Foster Wheeler) shall provide the filters for washing and acceptance testing (procured under the CSN contract). The contractor shall follow the SOP for Cleaning Nylon Filters Used for the Collection of PM2.5 Material

(https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/pm25nyloncleaningsop.pdf) for cleaning and the Standard Operating Procedure for Procurement and Acceptance Testing of Teflon, Nylon, and Quartz Filters (https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/RTIFilterProcurementSOPFINAL.pdf) for acceptance testing. The cleaned filters must meet EPA's acceptance testing criteria for the CSN, of an average for each cleaning batch that is ≤ 1 ug/filter for each ion (chloride, ammonium, sodium, potassium, nitrate and sulfate). Acceptance testing shall occur on 5% of the filters per batch that is cleaned, likely to occur on a weekly basis. We anticipate approximately 300-600 filters will be cleaned on a weekly basis, and acceptance testing results shall be submitted to OAQPS within 7 days of completion of the pre-cleaning and drying. Data shall be summarized and delivered to the CORs in an agreed upon format. The contractor shall provide cleaned filters and acceptance testing results to Wood PLC on a weekly basis for deployment in network. The CSN uses up to 1500 nylon filters per month. Should the CSN filter manufacturer begin providing nylon filters that meet EPA's acceptance test criteria without the need for washing, the TOPO shall inform the contractor that there is no longer a need for these services. The maximum number of filters to be pre-washed and acceptance tested under this task is 18,000.

# 3. 25mm Teflon Filter Special Study – Filter Handling

Wood PLC shall provide filter handling support for a 25mm Teflon filter special study for the CSN. They shall insert 25mm filter holders, stainless steel screens, and Teflon filters into the MetOne SASS/SuperSASS modules for sample collection at the six collocated CSN sites. EPA will provide the filter holders, screens, and Teflon filters. The six collocated sites are: Bakersfield and Riverside, CA; Deer Park, TX; Roxbury, MA; G.T. Craig, OH; and Rutgers, NJ. The 25mm Teflon filter collection will occur every 6<sup>th</sup> day for one year. Once the filters are collected, they will be packaged and shipped under ice by Wood PLC to UC Davis for multi-element analysis by X-Ray Fluorescence analysis. Filters shall be shipped to UCD monthly.

# 4. Travel to Meetings

None anticipated.

# V. DELIVERABLES AND SCHEDULE

#### 1. Proposal

The contractor shall deliver a Task Order Proposal in accordance with clause B.7 Task Order Ordering Procedures of the contract. The proposal shall be submitted 10 days after receipt of the SOW.

# 2. Monthly Progress Report

The contractor shall prepare and submit a monthly progress report by the 15<sup>th</sup> of each month summarizing the progress made, issues encountered or expected, work planned for the next reporting period and costs. These

reports shall comply with contract clauses F.3 Reports of Work and F.5 Monthly Progress Report. Reports shall be delivered electronically.

# **Distribution of Deliverables:**

Addressee	Copies
EPA Contracting Officer (Mike Fox)	1
EPA Project Officer (Melissa Puchalski)	1
EPA TOPO (Joann Rice)	1
EPA Alternate (Laurie Trinca)	1
EPA Technical Advisor (Taylor Macy)	1

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts							
Period	Previous Amount	This Action	Amount				
Base Period		\$107,794.56	\$107,794.56				
Total		\$107,794.56	\$107,794.56				

	Total Task Order Ceiling							
Period	Previous Amount	This Action	Amount					
Base Period	-	\$107,796.00	\$107,796.00					
Total	-	\$107,796.00	\$107,796.00					

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

AMENDME	NT OF SOLICITATION/MODIFICA	ATION OF CO	NTRACT		CONTRACT ID CODE	PAG	E OF PAGES
2. AMENDME	NT/MODIFICATION NO.	3. EFFECTIVE	DATE	4. RE0	L QUISITION/PURCHASE REQ. NO.	5. PROJEC	T NO. (If applicable)
P00001		See Bloo	k 16C	PR-0	DAR-19-00162		
6. ISSUED BY	CODE	HPOD		7. AD	MINISTERED BY (If other than Item 6)	CODE	
William 1200 Pe Mail Co	ronmental Protection Jefferson Clinton Bu nnsylvania Avenue, N. de: 3803R ton DC 20460	ilding				<u></u>	
8. NAME AND	ADDRESS OF CONTRACTOR (No., street,	county, State and	ZIP Code) (	(x) 9A	. AMENDMENT OF SOLICITATION NO.		
Attn: JOSEF 751 Arbor V Ste 180	/IRONMENT & INFRASTRUCTU PH FARRELL Vay \(\dagged \)	IRE SOLUTIO	DNS, INC.	9B × 10 6	. DATED (SEE ITEM 11)  A. MODIFICATION OF CONTRACT/ORDER N P-W-16-015 8HE0H18F1543 B. DATED (SEE ITEM 13)	0.	
CODE 03	8086125	FACILITY COD	E		7/24/2018		
	s ets en 10 to SCCYSCOMO	11. THIS ITE	M ONLY APPLIES TO AN		MENTS OF SOLICITATIONS		
Items 8 and separate lef RECEIVED OFFER. If each letter of	15, and returning cop tter or electronic communication which inclu- AT THE PLACE DESIGNATED FOR THE by virtue of this amendment you desire to co- or electronic communication makes referen- TING AND APPROPRIATION DATA (If requ- edule	oies of the amend udes a reference RECEIPT OF Of change an offer a nce to the solicita uired)	Iment; (b) By acknowledge to the solicitation and am FERS PRIOR TO THE Harady submitted , such clion and this amendment,	ging re nendma HOUR shange , and is	ion or as amended , by one of the following me ceipt of this amendment on each copy of the off ent numbers. FAILURE OF YOUR ACKNOWL AND DATE SPECIFIED MAY RESULT IN REJE may be made by letter or electronic communics received prior to the opening hour and date specified see:  \$3  ODIFIES THE CONTRACT/ORDER NO. AS DES	fer submitted LEDGEMENT ECTION OF Nation, provide Decified.	; or (c) By TO BE YOUR ad
CHECK ONE	30 W W	CT/ORDER IS MO I IN ITEM 14, PU	ODIFIED TO REFLECT TO RSUANT TO THE AUTH	HE AD ORITY	GES SET FORTH IN ITEM 14 ARE MADE IN THE MINISTRATIVE CHANGES (such as changes if OF FAR 43.103(b).		
**	D. OTHER (Specify type of modification	•					
X	Mutual Agreement of	pi-in					
DUNS Nur	TION OF AMENDMENT/MODIFICATION ( mber: 038086125	Organized by U		uding :	solicitation/contract subject matter where feasib	ole.)	
Accordant and cost being in \$3,477.4	nce with Attachment A t proposal dated Nover ncreased by \$3,476.00 44 is being added to	, Revised mber 26, , from \$1 this tas!	d Statement o 2018 (7 page 107,796.00 to c order. This	of W s). \$1 or	he revised statement of ork (4 pages) and the rather that the price of thi 11,272.00. Funding in the der is fully funded as achment B is hereby inc	evised s task he amou detaile	technical order is unt of ed in
which the Continue	ne Contractor is not a ed vided herein, all terms and conditions of th	authorize	ed to exceed.	Th	total ceiling price of e Contractor exceeds at eretofore changed, remains unchanged and in f	its ow	vn risk. effect.
IDA. NAME A	ND TITLE OF SIGNER (Type or print)				NAME AND TITLE OF CONTRACTING OFFIC	J⊑K (Type or	ртику
					chael C. Fox		T
15B. CONTRA	ACTOR/OFFEROR  (Signature of person authorized to sign)	_	15C. DATE SIGNED			L FOTRONIC S:GNATURE	

CONTINUATION SHEET

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PAGE 2 OF 3

NAME OF OFFEROR OR CONTRACTOR

ΓΕΜ NQ.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
A)	(B)	(C)	(D)	(E)	(F)
	The total obligated/funded ceiling amount for				
	this order is currently \$111,272.00. This order				
	is fully funded as detailed in Attachment B				
	Summary of Amounts and Ceilings and Attachment B				
	is hereby incorporated (1 page).				
	LIST OF CHANGES:				
	Reason for Modification: Supplemental Agreement				
	for work within scope				
	Total Amount for this Modification: \$3,476.00 New				
	Total Amount for this Version: \$111,272.00 New				
	Total Amount for this Award: \$111,272.00				
	Obligated Amount for this Modification: \$3,477.44				
	New Total Obligated Amount for this Award:				
	\$111,272.00				
	Incremental Funded Amount changed: from				
	\$107,794.56 to \$111,272.00				
	CHANGES FOR LINE ITEM NUMBER: 1				
	Total Amount changed				
	from \$107,796.00 to \$111,272.00				
	Obligated Amount for this Modification: \$3,477.44				
	Incremental Funded Amount changed from				
	\$107,794.56 to \$111,272.00				
	FOB changed from Destination to				
	CHANGES FOR DELIVERY LOCATION: OAR/OAQPS/AQAD				
	Amount changed from \$107,796.00 to \$111,272.00				
	NEW ACCOUNTING CODE ADDED:				
	Account code:				
	18-E1-53GS-000A04XPM-4183-1953PM9011-001				
	Beginning FiscalYear 18				
	Ending Fiscal Year				
	Fund (Appropriation) E1				
	Budget Organization 53GS				
	Program (PRC) 000A04XPM				
	Budget (BOC) 4183				
	Job # (Site/Project)				
	Cost Organization				
	DCN-LineID 1953PM9011-001				
	Amount: \$3,477.44				
	Subject To Funding: N				
	Payment Address:				
	RTP Finance Center				
	US Environmental Protection Agency				
	RTP-Finance Center (AA216-01)				
	109 TW Alexander Drive				
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NAME OF OFFEROR OR CONTRACTOR

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	<b>UNIT</b> (D)	UNIT PRICE (E)	AMOUNT (F)
	www2.epa.gov/financial/contracts Durham NC 27711				
	Payment:  RTP Finance Center  US Environmental Protection Agency  RTP-Finance Center (AA216-01)  109 TW Alexander Drive  www2.epa.gov/financial/contracts  Durham NC 27711  Period of Performance: 07/25/2018 to 07/08/2019				

# **ATTACHMENT A**

(revised November 15, 2018)

Title: Supplemental Laboratory and Filter Handling Support for CSN

Contractor: Wood Environment & Infrastructure Solutions Inc.

**Contract #:** EP-W-16-015

**Task Order #:** 2013

**Period of Performance:** 7/09/2018 to 7/08/2019

# **EPA Key Personnel**

# Task Order Project Officer (TOPO)/Contract Level Project Officer (PO):

Joann Rice

Air Quality Assessment Division (OAR/OAQPS/AQAD)

Mail Drop C304-06

Research Triangle Park, NC 27711

Phone: (919) 541-3372 Email: rice.joann@epa.gov

#### **Alternate TOPO:**

Laurie Trinca

Air Quality Assessment Division (OAR/OAQPS/AQAD)

Mail Drop C304-06

Research Triangle Park, NC 27711

phone: (919) 541-2262 email: trinca.laurie@epa.gov

# **Contracting Officer (CO):**

Mike Fox

**Contracting Officer** 

Administrative Contract Service Center

1200 Pennsylvania Ave N.W.

Mail Code 3803R

Washington DC 20460

phone: (202) 564-2550 email: fox.michael@epa.gov

#### STATEMENT OF WORK

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- Monitor the status and trends in regional air quality and atmospheric deposition;
- Assess and report on geographic patterns and long-term, temporal trends in ambient air pollution and atmospheric deposition;
- Improve our understanding of PM and ozone formation;
- Validate and improve atmospheric models;
- Provide data for health-based research and epidemiology studies;
- Assess the effectiveness of EPA's emission reduction programs; and
- Support science and ecosystem studies.

CASTNET sites measure weekly average concentrations of sulfate (SO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>), sulfur dioxide (SO<sub>2</sub>), nitric acid (HNO<sub>3</sub>), chloride (Cl<sup>-</sup>) and the base cations (Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>and Ca<sup>2+</sup>) using a 3-stage filter pack. In addition, each site may make ancillary measurements, including hourly ozone (O<sub>3</sub>), hourly meteorology, ammonia (NH<sub>3</sub>) gas using passive devices, and trace-level gases. Trace-level gas monitors include reactive oxidized nitrogen (NOy), nitric oxide (NO), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO). CASTNET O<sub>3</sub>, meteorological, and trace gas measurements follow the requirements in the Code of Federal Regulations (CFR) and EPA's Quality Assurance Handbook.

# II. PURPOSE

The primary purpose of this task order is to pre-wash nylon filters for the Chemical Speciation Network (CSN), conduct acceptance testing, and support a 25mm Teflon filter study. Once the filters have been washed and pass the CSN acceptance testing criteria, they will be shipped to Wood PLC (formerly Amec Foster Wheeler) for use in the routine network, which functions under a contract between Wood PLC and EPA's OAQPS. For the 25mm Teflon filter study, Wood PLC will be responsible for inserting 25mm filter holders and 25mm Teflon filters into the MetOne SASS/SuperSASS stainless steel modules for sample collection. The Task Order Project Officer shall provide technical direction for performance of specific tasks under this task order.

# III. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this task order are consistent with the activities authorized in CLIN 22 of the contract's Statement of Work.

#### IV. TECHNICAL DIRECTION

# 1. Prepare a Technical Proposal & Cost Estimate

The Contractor shall prepare a Task Order Proposal in accordance with the terms and conditions of contract clauses B.2 entitled Fixed Rates for Services – Indefinite delivery/Indefinite quantity contract.

# 2. Pre-wash and acceptance test the Chemical Special Network (CSN) Nylon Filters

The Contractor shall prewash and acceptance test nylon filters for the Chemical Speciation Network. Wood PLC (formerly Amec Foster Wheeler) shall provide the filters for washing and conduct acceptance testing (procured under the CSN contract). The contractor shall follow the SOP for Cleaning Nylon Filters Used for the Collection of PM2.5 Material

(https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/pm25nyloncleaningsop.pdf) for cleaning and the Standard Operating Procedure for Procurement and Acceptance Testing of Teflon, Nylon, and Quartz Filters (https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/RTIFilterProcurementSOPFINAL.pdf) for acceptance testing. The cleaned filters must meet EPA's acceptance testing criteria for the CSN, of an average for each cleaning batch that is ≤ 1 ug/filter for each ion (chloride, ammonium, sodium, potassium, nitrate and sulfate). Acceptance testing shall occur on 5% of the filters per batch that is cleaned, likely to occur on a weekly basis. We anticipate approximately 300-600 filters will be cleaned on a weekly basis, and acceptance testing results shall be submitted to OAQPS within 7 days of completion of the pre-cleaning and drying. Data shall be summarized and delivered to the CORs in an agreed upon format. The contractor shall provide cleaned filters and acceptance testing results to Wood PLC on a weekly basis for deployment in network. The CSN uses up to 1500 nylon filters per month. Should the CSN filter manufacturer begin providing nylon filters that meet EPA's acceptance test criteria without the need for washing, the TOPO shall inform the contractor that there is no longer a need for these services. The maximum number of filters to be pre-washed and acceptance tested under this task is 18,000.

# 3. 25mm Teflon Filter Special Study – Filter Handling

Wood PLC shall provide filter handling support for a 25mm Teflon filter special study for the CSN. They shall insert 25mm filter holders, stainless steel screens, and Teflon filters into the MetOne SASS/SuperSASS modules for sample collection at the six collocated CSN sites. EPA will provide the filter holders, screens, and Teflon filters. The six collocated sites are: Bakersfield and Riverside, CA; Deer Park, TX; Roxbury, MA; G.T. Craig, OH; and Rutgers, NJ. The 25mm Teflon filter collection will occur every 6<sup>th</sup> day for one year. Once the filters are collected, they will be packaged and shipped under ice by Wood PLC to UC Davis for multi-element analysis by X-Ray Fluorescence analysis. Filters shall be shipped to UCD monthly.

# 4. Database Modification for Daily Sampling

As part of special studies in both Alaska and Utah, three sites will be doing daily sampling during the winters of 2018/2019 and 2019/2020. The three sites are: Cache Valley (Smithfield) and Hawthorne, Utah; and North Pole (Fairbanks), Alaska. Wood PLC shall modify the sample handling database to receive and process filters sampled daily and provide chain of custody files to UC Davis for filter analysis.

# 5. Travel to Meetings

None anticipated.

#### V. DELIVERABLES AND SCHEDULE

#### 1. Proposal

The contractor shall deliver a Task Order Proposal in accordance with clause B.7 Task Order Ordering Procedures of the contract. The proposal shall be submitted 10 days after receipt of the SOW.

# 2. Monthly Progress Report

The contractor shall prepare and submit a monthly progress report by the 15<sup>th</sup> of each month summarizing the progress made, issues encountered or expected, work planned for the next reporting period and costs. These reports shall comply with contract clauses F.3 Reports of Work and F.5 Monthly Progress Report. Reports shall be delivered electronically.

# **Distribution of Deliverables:**

Addressee	Copies
EPA Contracting Officer (Mike Fox)	1
EPA Project Officer (Melissa Puchalski)	1
EPA TOPO (Joann Rice)	1
EPA Alternate (Laurie Trinca)	1
EPA Technical Advisor (Taylor Macy)	1

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts							
Period	<b>Previous Amount</b>	This Action	Amount				
Base Period	\$107,794.56	\$3,477.44	\$111,772.00				
Total	\$107,794.56	\$3,477.44	\$111,772.00				

Total Task Order Ceiling							
Period	Previous Amount	This Action	Amount				
Base Period	\$107,796.00	\$3,746.00	\$111,772.00				
Total	\$107,796.00	\$3,476.00	\$111,772.00				

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

AMENDMENT OF SOLICITATION/MODIFIC	ONTRACT		1. CONTRACT ID CODE	OF PAGES							
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE	DATE	4. R		5. PROJECT	NO. (If applicable)					
P00002	See Bloo	ck 16C			2013						
6. ISSUED BY CODE	HQAD		7. /	ADMINISTERED BY (If other than Item 6)	CODE						
HQAD US Environmental Protection William Jefferson Clinton Bu 1200 Pennsylvania Avenue, N. Mail Code: 3803R Washington DC 20460	ilding										
en communities and contradicated provide assessment as the contradicated and contradicated and contradicated as	t county State and	7/P Code)	Н	A AMENDMENT OF SOLICITATION NO							
8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)  WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.  Attn: JOSEPH FARRELL  751 Arbor Way  Ste 180  Blue Bell PA 194221972				9B. DATED (SEE ITEM 11)  2 10A. MODIFICATION OF CONTRACT/ORDER NO. EP-W-16-015 68HE0H18F1543 10B. DATED (SEE ITEM 13)							
CODE 038086125	FACILITY CODI		1	07/24/2018							
27 25, 49, 41 2 C SCHECTHER	11. THIS ITE	M ONLY APPLIES TO A	MEN	DMENTS OF SOLICITATIONS							
separate letter or electronic communication which incl RECEIVED AT THE PLACE DESIGNATED FOR THE OFFER. If by virtue of this amendment you desire to each letter or electronic communication makes referen	pies of the amend udes a reference RECEIPT OF OI change an offer a nce to the solicita	dment; (b) By acknowled to the solicitation and ar FFERS PRIOR TO THE Iready submitted, such	dging meno HOU chan	receipt of this amendment on each copy of the of ment numbers. FAILURE OF YOUR ACKNOWL R AND DATE SPECIFIED MAY RESULT IN REJE ge may be made by letter or electronic communic	fer submitted; EDGEMENT T ECTION OF YO ation, provided	or (c) By O BE OUR					
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Stockhole - American American American	ODIFICATION O	CONTRACTS/ORDERS	s it	MODIFIES THE CONTRACT/ORDER NO. AS DE	SCRIBED IN IT	FM 14					
	CT/ORDER IS MO H IN ITEM 14, PU	DDIFIED TO REFLECT I RSUANT TO THE AUTH	THE /	NGES SET FORTH IN ITEM 14 ARE MADE IN TO ADMINISTRATIVE CHANGES (such as changes of TY OF FAR 43.103(b).							
D. OTHER (Specify type of modification	• /										
X EPA-B-32-103 - LIMIT	ATION OF	GOVERNMENT'	S	DBLIGATION							
E. IMPORTANT: Contractor	is required to	sign this document and	d retu	rn copies to the issuing	g office.						
14. DESCRIPTION OF AMENDMENT/MODIFICATION	(Organized by U	CF section headings, inc	cludin	g solicitation/contract subject matter where feasib	ole.)						
DUNS Number: 038086125 The purpose of this modifica this task order. TOCOR: Beth Landis	tion is t	co de-obligat	te	funding in the amount of	\$43,80	2.48 from					
LIST OF CHANGES:											
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Obligated Amount for this Mo											
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15A. NAME AND TITLE OF SIGNER (Type or print)	ie document refe	enced in item 9 A of 10A	0A, as heretofore changed, remains unchanged and in full force and effect.  16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)								
, , , , , , , , , , , , , , , , , , , ,				ichael C. Fox		,					
15D CONTRACTOR/OFFEROR	1	150 DATE OLONES				160 DATE CIONES					
15B. CONTRACTOR/OFFEROR		15C. DATE SIGNED			L FOTRONIC	16C. DATE SIGNED					
(Signature of person authorized to sign)			-	(Signature of Contracting Officer)	S:GNATURE	10/16/2019					

 CONTINUATION SHEET
 REFERENCE NO. OF DOCUMENT BEING CONTINUED
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 OF

 EP-W-16-015/68HE0H18F1543/P00002
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NAME OF OFFEROR OR CONTRACTOR

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	CHANGES FOR LINE ITEM NUMBER: 1				
	Obligated Amount for this Modification: -\$43,802.48				
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	18-E1-53GS-000A04XPM-4183-1853PM8084-001				
	Amount changed from \$107,794.56 to \$63,992.08				
	Payment:				
	RTP Finance Center				
	US Environmental Protection Agency				
	RTP-Finance Center (AA216-01)				
	109 TW Alexander Drive				
	www2.epa.gov/financial/contracts Durham NC 27711				
	Period of Performance: 07/25/2018 to 07/08/2019				
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WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC. Attn: JOSEPH FARRELL 751 Arbor Way Ste 180 Blue Bell PA 194221972  (b)(4)  TELEPHONE NO.  17b. CHECK IF REMITTANCE IS DIFFERENT AND PUT SUCH ADDRESS IN OFFER				RTP Finance Center US Environmental Protection Agency RTP-Finance Center (AA216-01) 109 TW Alexander Drive www2.epa.gov/financial/contracts Durham NC 27711  18b. SUBMIT INVOICES TO ADDRESS SHOWN IN BLOCK 18a UNLESS BLOCK BELOW					ELOW	
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DUNS Number: 038086125 Title: Characterization of reduced Nitrogen at IMPROVE and CSN Monitoring Sites: Analysis of nylon filters for Anions. (2012)  This task order is issued in accordance with Task Order Ordering Procedures and hereby incorporates the base contract terms and conditions by reference. The effective date for performance to commence is August 14, 2018.  (Use Reverse and/or Attach Additional Sheets as Necessary)										
25. ACCOUNT	ING AND APPROPRI	ATION DATA					26	. TOTAL AWARD AMO	UNT (For Gov	vt. Use Only)
See Schedule							\$19,270	.00		
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28. CONTRACTOR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN COPIES TO ISSUING OFFICE. CONTRACTOR AGREES TO FURNISH AND DELIVER ALL ITEMS SET FORTH OR OTHERWISE IDENTIFIED ABOVE AND ON ANY ADDITIONAL SHEETS SUBJECT TO THE TERMS AND CONDITIONS SPECIFIED.  30a. SIGNATURE OF OFFEROR/CONTRACTOR				AND DELIVER	31a. UNITE	HEREIN, IS A D STATES OF A	ANY ADDIT	. YOUR OFFI IONS OR CHANGES AS TO ITEMS:  ENATURE OF CONTRACT	WHICH ARE	
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	the accepte	ed technical propo	sal	and cost esti	mate					
	dated Augus	st 9, 2018 (9 page	es) i	n the amount	of					
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	the Contrac	ctor is not author	ized	to exceed. I	:he					
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NAME OF OFFEROR OR CONTRACTOR

EM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	and CSN Monitoring Sites: Analysis of nylon				
	filters for Anions.				
	Accounting Info:				
	18-E1-53GS-000A04XPM-4183-1853PM8092-001 BFY: 18 Fund: E1 Budget Org: 53GS Program (PRC):				
	000A04XPM Budget (BOC): 4183 DCN - Line ID: 1853PM8092-001				
	Funding Flag: Partial				
	Funded: \$19,270.00				

# **ATTACHMENT A Statement of Work**

**Title:** Characterization of reduced nitrogen at IMPROVE and CSN

monitoring sites: Analysis of nylon filters for Anions.

Contractor: Wood Environment & Infrastructure Solutions Inc.

**Contract #:** EP-W-16-015

**Project #:** 2012

**Period of Performance:** August 14, 2018 through July 8, 2019

# **EPA Key Personnel**

# Task Order Project Officer (TOPO)/Contract Level Project Officer (PO):

Joann Rice

Air Quality Assessment Division (OAR/OAQPS/AQAD)

Mail Drop C304-06

Research Triangle Park, NC 27711

Phone: (919) 541-3372 Email: rice.joann@epa.gov

#### **Alternate TOPO:**

Melissa Puchalski

Clean Air Markets Division (OAP/OAR/CAMD)

1200 Pennsylvania Ave., NW

Mail Code 6204M

Washington, DC 20460

phone: (202) 343-9882

email: puchalski.melissa@epa.gov

# **Contracting Officer (CO):**

Michael Fox

Contracting Officer

Administrative Contract Service Center

1200 Pennsylvania Ave N.W.

Mail Code 3803R

Washington DC 20460

phone: (202) 564-2550

email: fox.michael@epa.gov

#### STATEMENT OF WORK

#### I. INTRODUCTION

The Clean Air Status and Trends Network (CASTNET) is a long-term environmental monitoring network that measures changes in ambient air quality and assesses atmospheric deposition over broad geographic regions of the U.S. (<a href="https://www.epa.gov/castnet">https://www.epa.gov/castnet</a>). Operating since 1987, CASTNET has evolved into a robust regional monitoring program which currently consists of approximately 95 monitoring stations nationwide. The Environmental Protection Agency (EPA) coordinates the operation of the network in cooperation with numerous federal, tribal, state and local partners.

The primary monitoring objectives of CASTNET are to:

- Provide high quality data on atmospheric deposition, rural ground level ozone and other forms of atmospheric pollution;
- Support the primary and secondary ozone National Ambient Air Quality Standards (NAAQS) and provide data on NAAQS compliance in rural areas;
- Monitor the status and trends in regional air quality and atmospheric deposition;
- Assess and report on geographic patterns and long-term, temporal trends in ambient air pollution and atmospheric deposition;
- Improve our understanding of Particulate Matter (PM) and ozone formation;
- Validate and improve atmospheric models;
- Provide data for health-based research and epidemiology studies;
- Assess the effectiveness of EPA's emission reduction programs; and
- Support science and ecosystem studies.

CASTNET sites measure weekly average concentrations of sulfate (SO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>), sulfur dioxide (SO<sub>2</sub>), nitric acid (HNO<sub>3</sub>), chloride (Cl<sup>-</sup>) and the base cations (Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>and Ca<sup>2+</sup>) using a 3-stage filter pack. In addition, each site may make ancillary measurements, including hourly ozone (O<sub>3</sub>), hourly meteorology, ammonia (NH<sub>3</sub>) gas using passive devices, and trace-level gases. Trace-level gas monitors include reactive oxidized nitrogen (NO<sub>y</sub>), nitric oxide (NO), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO). CASTNET O<sub>3</sub>, meteorological, and trace gas measurements follow the requirements in the Code of Federal Regulations (CFR) and EPA's Quality Assurance Handbook.

# II. Background

The Interagency Monitoring of Protected Visual Environments (IMPROVE) and Chemical Speciation (CSN) networks have provided two decades of routine particulate matter speciation data that support regional haze and PM NAAQS programs. The Clean Air Status and Trends Network (CASTNET) and National Atmospheric Deposition Program (NADP) have provide routine measurements of particulate, gaseous and wet deposition to support acid deposition programs. Over this period the chemical composition of the ambient atmosphere has changed markedly from one dominated by nitrate, sulfate and carbonaceous aerosols, and their associated precursor gases (NO<sub>x</sub>, SO<sub>x</sub>, VOCs, SVOCs), to an atmospheric mixture that includes a significant amount of reduced inorganic nitrogen – particulate ammonium (NH<sub>4</sub><sup>+</sup>) and its precursor gas, ammonia (NH<sub>3</sub>). The magnitude of this change is reflected by a nationwide shift in the atmospheric nitrogen budget from one dominated by inorganic oxidized compounds, to one where reduced inorganic nitrogen species (NH<sub>x</sub> = NH<sub>3</sub><sup>+</sup> NH<sub>4</sub><sup>+</sup>) now have similar or greater concentrations. Total atmospheric nitrogen compounds are still primarily in inorganic forms, but have significant contributions from organically bound nitrogen (both reduced and oxidized forms). Looking forward, the shift to larger relative contributions of atmospheric reduced inorganic nitrogen is

projected to continue as existing rules and technologies continue to decrease NOx emissions from the transportation and energy generation sectors with an expected modest increase in NH3 emissions.

#### III. PURPOSE

This Task Order (TO) is a follow-on to TO 1012 for the analysis of extracts from nylon filters collected during the Duke Forest and Gainesville  $NH_x$  study. The primary purpose of TO 1012 was to characterize reduced nitrogen ( $NH_x = NH_3 + NH_4^+$ ) using existing network methodologies as a cost-effective, efficient way to characterize a significant contributor to PM formation, visibility degradation, and total nitrogen deposition. The objective of Task Order 1012 was to demonstrate if acid-impregnated filters within the IMPROVE module and the CSN Super Speciation Air Sampling System (SASS) can provide accurate  $NH_x$  concentrations in humid climates with low to moderate ambient  $NH_3$  concentrations (Duke Forest, North Carolina and Gainesville, Florida) for approximately six months.

#### IV. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this task order are consistent with the activities authorized in CLIN 22 of the contract's Statement of Work.

#### V. TECHNICAL DIRECTION

# 1. Prepare a Technical Proposal & Cost Estimate

The Contractor shall prepare a Task Order Proposal in accordance with the terms and conditions of contract clauses B.2 entitled Fixed Rates for Services – Indefinite delivery/Indefinite quantity contract.

# 2. Sample Analysis for Anions

Three nylon filters from the primary annular denuder system (ADS), duplicate ADS, and CSN SASS system were extracted under TO 1012 and kept in refrigerated storage. The extracts were collected on the 57 sample dates identified in the table below. The contactor shall analyze the extracts for sulfate, nitrate, chloride, and if possible an estimate of oxalate. The extracts shall be analyzed using the Standard Operating Procedures for Determination of Anions and/or Cations Extracted from Nylon Filters by Ion Chromatography (IC), Rev. 5. Mar. 3, 2016 (http://vista.cira.colostate.edu/Improve/wp-content/uploads/2016/07/IMPROVE-Anion-Cation-Analysis-by-Ion-Chromatography-SOP-2016.pdf).

Laboratory analysis results shall be converted to concentrations using the total sample volume and recorded in the database.

Duke Forest Sample Dates (38)	Gainesville Sample Dates (19)
5/25/17	5/31/17
5/28/17	7/27/17
5/31/17	8/2/17
6/3/17	8/5/17
6/6/17	8/17/17
6/15/17	8/20/17
6/18/17	8/23/17
6/24/17	8/26/17
6/27/17	8/29/17
7/6/17	9/19/17

7/9/17	9/28/17
7/12/17	10/1/17
7/15/17	10/4/17
7/18/17	10/7/17
7/27/17	10/10/17
7/30/17	10/19/17
8/2/17	10/22/17
8/5/17	10/25/17
8/8/17	10/31/17
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10/7/17	
10/10/17	
10/19/17	
10/22/17	
10/25/17	
10/28/17	
10/31/17	
11/3/17	

# 3. Data Analysis and Summary Report

The contractor shall finalize the data set including the data collected under TO 1012. This shall include using blank information, flow data and laboratory QC results to provide a final validated database. This shall also include the anion data analyzed under subtask 2. Metadata shall be included in the data submittal, including descriptions of flags and equations used to calculate ambient concentrations.

The contractor shall deliver a final summary report describing the purpose of the study, the sample procedures, a summary of the ambient data, and field and laboratory QA results. The report shall include plots and charts that describe any biases in sampling methods. Concurrently, additional testing of the URG ADS samplers are being conducted by US EPA/ORD in RTP, NC. Preliminary results from that study may be summarized in this report if the data help explain the breakthrough on ADS found during the field sampling campaign under TO 1012.

With technical direction, the contractor may be asked to assist with providing conclusions to the report. This shall not be included in the labor hours until technical direction is provided.

#### VI. DELIVERABLES AND SCHEDULE

# 1. Proposal

The contractor shall deliver a Task Order Proposal in accordance with clause B.7 Task Order Ordering Procedures of the contract. The proposal shall be submitted 10 days after receipt of the SOW.

# 2. Monthly Progress Report

The contractor shall prepare and submit a monthly progress report by the 15<sup>th</sup> of each month summarizing the progress made, issues encountered or expected, work planned for the next reporting period and costs. These reports shall comply with contract clauses F.1 Monthly Progress Report. Reports and F-5 Reports of Work shall be delivered electronically.

#### 3. Database

The contractor shall deliver a database submittal(s) with valid anion laboratory data and all QA/QC data reported. Anion results from the previous 30-day period of analysis runs shall be submitted no later than 30 days after the last sample of the month was analyzed. The final study database including metadata shall be delivered in conjunction with the summary report on November 1, 2018.

# 4. Summary Report

The contractor shall deliver a final summary report with charts and tables describing the final results of the  $NH_x$  measurements. Statistical analyses shall be performed to describe biases between the sampling methods. A draft report shall be delivered by November 1, 2018. A final summary report shall be delivered 30-days after final comments are received by the EPA technical advisors.

# **Distribution of Deliverables:**

Addressee	Copies
EPA Contracting Officer (Mike Fox)	1
EPA Project Officer (Joann Rice)	1
EPA Alternate (Melissa Puchalski)	1
EPA Technical Advisor (John Walker)	1
NPS Technical Advisor (Bret Schichtel)	1

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts							
Period	Previous Amount	This Action	Amount				
Base Period	-	\$19,270.00	\$19,270.00				
Total	-	\$19,270.00	\$19,270.00				

Total Task Order Ceiling							
Period	Previous Amount	This Action	Amount				
Base Period	-	\$19,270.00	\$19,270.00				
Total	-	\$19,270.00	\$19,270.00				

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

AMENDMENT OF SOLICITATION/MODIFICA	ATION OF CONTRACT	1. CONTRACT ID CODE	PAGE	OF PAGES						
2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REC	UISITION/PURCHASE REQ. NO.	5. PROJECT	Σ Γ NO. (If applicable)					
P00001	See Block 16C			201						
6. ISSUED BY CODE	HPOD	7. ADI	MINISTERED BY (If other than Item 6)	CODE						
HPOD US Environmental Protection William Jefferson Clinton Bu 1200 Pennsylvania Avenue, N. Mail Code: 3803R Washington DC 20460										
8. NAME AND ADDRESS OF CONTRACTOR (No., street,	county, State and ZIP Code)	(x) 9A.	AMENDMENT OF SOLICITATION NO.							
WOOD ENVIRONMENT & INFRASTRUCTU Attn: JOSEPH FARRELL 751 Arbor Way Ste 180 Blue Bell PA 194221972		98. × 10/ 68	9B. DATED (SEE ITEM 11)							
CODE 038086125	FACILITY CODE	7   o	8/14/2018							
	11. THIS ITEM ONLY APPLIES TO	AMENDM	ENTS OF SOLICITATIONS	-						
The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers  Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended , by one of the following methods: (a) By completing Items 8 and 15, and returning  copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or electronic communication which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by letter or electronic communication, provided each letter or electronic communication makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.										
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C. THIS SUPPLEMENTAL AGREEMENT	IS ENTERED INTO PURSUANT TO	AUTHORIT	Y OF.							
D. OTHER (Specify type of modification a	and authority)				*****					
X Mutual Agreement of	the Parties									
E. IMPORTANT: Contractor is not	🗵 is required to sign this document a	ind return	1 copies to the issuing	office.						
14. DESCRIPTION OF AMENDMENT/MODIFICATION (	Organized by UCF section headings,	ncluding s								
DUNS Number: 038086125		_	•							
The purpose of this modificat days, at no additional cost to changed from July 8, 2019 to TOCOR: Melissa Puchalski LIST OF CHANGES: Reason for Modification: Suppression of Performance End Date CHANGES FOR LINE ITEM NUMBER: End Date changed from 08-JUL-	co the government. August 8, 2019.  Delemental Agreement ce changed from 08-	The pe	eriod of performance end							
Continued										
Except as provided herein, all terms and conditions of the	document referenced in Item 9 A or	IOA, as her	etofore changed, remains unchanged and in fu	ıll force and e	ffect.					
15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)								
Kemp Howell - Project	Manager	Michael C. Fox								
15B. CONTRACTOR/OFFEROR  (Signature of person authorized to sign)	6 24 19			ECTRONIC IIGNATURE	16C. DATE SIGNED 06/21/2019					
Provious adition unusable	L		(Signature of Contracting Officer)	···	I					

# CONTINUATION SHEET

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PAGE 2 OF 2

NAME OF OFFEROR OR CONTRACTOR

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	Payment:				
	RTP Finance Center				
	US Environmental Protection Agency				
	RTP-Finance Center (AA216-01)				
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	www2.epa.gov/financial/contracts				
	Durham NC 27711				
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HQAD US Environmental Protection	7 con au				
William Jefferson Clinton Bu	_				
1200 Pennsylvania Avenue, N	. w.				
Mail Code: 3803R Washington DC 20460					
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WOOD ENVIRONMENT & INFRASTRUCTI	URE SOLUTION	ONS, INC.			
Attn: JOSEPH FARRELL			9B. DATED (SEE ITEM 11)		
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Ste 180		_			
Blue Bell PA 194221972		×	10A. MODIFICATION OF CONTRACT/ORDER NEP-W-16-015	10.	
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DUNS Number: 038086125					
The purpose of this modification	ation is t	to de-obligate	e funding in the amount of	\$8,959	.06 from
this task order.					
TOCOR: Melissa Puchalski					
LIST OF CHANGES:					
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			Michael C. Fox		
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NAME OF OFFEROR OR CONTRACTOR

ITEM NO.	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	CHANGES FOR LINE ITEM NUMBER: 1 Obligated Amount for this Modification: -\$8,959.06 Incremental Funded Amount changed from \$19,270.00 to \$10,310.94				
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	Payment:  RTP Finance Center  US Environmental Protection Agency  RTP-Finance Center (AA216-01)  109 TW Alexander Drive  www2.epa.gov/financial/contracts  Durham NC 27711  Period of Performance: 08/14/2018 to 08/08/2019				

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		chalski, (202)343-		, ,						
		Melissa@epa.gov								
	Alternate									
		nca, (919)541-2262	,							
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NAME OF OFFEROR OR CONTRACTOR

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	18-E1-53GS-000A04XPM-4183-1853PM8115-001 BFY: 18 Fund: E1 Budget Org: 53GS Program (PRC):				
	000A04XPM Budget (BOC): 4183 DCN - Line ID:				
	1853PM8115-001				
	Funding Flag: Complete				
	Funded: \$31,095.00				

**Title:** Support for NCore Monitoring Sites

Contractor: Wood Environment & Infrastructure Solutions Inc.

**Contract #:** EP-W-16-015

**Task Order #:** 2015

**Period of Performance:** 10/04/2018 to 7/08/2019

# **EPA Key Personnel**

# Task Order Project Officer (TOPO)/Contract Level Project Officer (PO):

Melissa Puchalski Clean Air Markets Division (CAMD) Mail Drop 6204M Washington DC 20460

phone: (202) 343-9882

email: Puchalski.Melissa@epa.gov

# **Alternate TOPO:**

Laurie Trinca
Air Quality Assessment Division (OAR/OAQPS/AQAD)
Mail Drop C304-06
Research Triangle Park, NC 27711

phone: (919) 541-2262 email: trinca.laurie@epa.gov

# **Contracting Officer (CO):**

Mike Fox
Contracting Officer
Administrative Contract Service Center
1200 Pennsylvania Ave N.W.
Mail Code 3803R
Washington DC 20460

phone: (202) 564-2550 email: fox.michael@epa.gov

#### STATEMENT OF WORK

#### I. INTRODUCTION

The Clean Air Status and Trends Network (CASTNET) is a long-term environmental monitoring network that measures changes in ambient air quality and assesses atmospheric deposition over broad geographic regions of the U.S. (<a href="https://www.epa.gov/castnet">https://www.epa.gov/castnet</a>). Operating since 1987, CASTNET has evolved into a robust regional monitoring program which currently consists of approximately 95 monitoring stations nationwide. The Environmental Protection Agency (EPA) coordinates the operation of the network in cooperation with numerous federal, tribal, state and local partners.

The primary monitoring objectives of CASTNET are to:

- Provide high quality data on atmospheric deposition, rural ground-level ozone and other forms of atmospheric pollution;
- Support the primary and secondary ozone NAAQS and provide data on NAAQS compliance in rural
  areas;
- Monitor the status and trends in regional air quality and atmospheric deposition;
- Assess and report on geographic patterns and long-term, temporal trends in ambient air pollution and atmospheric deposition;
- Improve our understanding of PM and ozone formation;
- Validate and improve atmospheric models;
- Provide data for health-based research and epidemiology studies;
- Assess the effectiveness of EPA's emission reduction programs; and
- Support science and ecosystem studies.

CASTNET sites measure weekly average concentrations of sulfate (SO<sub>4</sub><sup>2-</sup>), nitrate (NO<sub>3</sub><sup>-</sup>), ammonium (NH<sub>4</sub><sup>+</sup>), sulfur dioxide (SO<sub>2</sub>), nitric acid (HNO<sub>3</sub>), chloride (Cl<sup>-</sup>) and the base cations (Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>and Ca<sup>2+</sup>) using a 3-stage filter pack. In addition, each site may make ancillary measurements, including hourly ozone (O<sub>3</sub>), hourly meteorology, ammonia (NH<sub>3</sub>) gas using passive devices, and trace-level gases. Trace-level gas monitors include reactive oxidized nitrogen (NOy), nitric oxide (NO), sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO). CASTNET O<sub>3</sub>, meteorological, and trace gas measurements follow the requirements in the Code of Federal Regulations (CFR) and EPA's Quality Assurance Handbook.

# II. PURPOSE

The primary purpose of this task order is to assist the Regional Air Pollution Control Agency (RAPCA) to install and operate a NO/NOy monitoring system at their NCore site (Site ID 39-135-1001) at the National Trail School located in Dayton, OH. RAPCA has run an Ecotech and most recently a Thermo NO/NOy system at their NCore site with significant operational issues. The Thermo system consistently loses signal when challenged with calibration gas necessitating an increase to the potentiometer. No specific issue with the system has been found by RAPCA or Thermo. Under this Task Order, Wood Environment and Infrastructure, Inc. (Wood) will obtain a Teledyne API NO/NOy system from OAQPS to install at the Dayton, OH NCore monitoring site and remotely review and troubleshoot any problems RAPCA has with the system. Wood will also provide an interim data summary report and a final brief assessment report describing any issues, changes in normal operating procedures and a summary of the data collected after approximately 1-year of operation.

#### III. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this task order are consistent with the activities authorized in CLIN 22 of the contract's Statement of Work.

#### IV. TECHNICAL DIRECTION

# 1. Prepare a Technical Proposal & Cost Estimate

The Contractor shall prepare a Task Order Proposal in accordance with the terms and conditions of contract clauses B.1 entitled Fixed Rates for Services – Indefinite delivery/Indefinite quantity contract.

# 2. Retrofit and calibration Teledyne API NO/NOy system

The contractor shall receive the Teledyne API T200U NO/NOy system from OAQPS. Upon arrival, the contractor shall test the system to verify that it is working properly.

The contractor shall also receive the repair kit from Teledyne to modify umbilical, the converter box and the pump box. This should bring all known electrical issues up to code with this system. The contractor shall follow the technical note for instructions on how to install the parts included in the kit.

Prior to shipping the system to Dayton, OH, Wood shall verify that all parts and equipment are in working order.

# 3. Install and Calibrate NO/NOy system at Dayton, OH Monitoring Site

EPA will set up an initial call with RAPCA and the contractor to discuss the equipment that is already at the site (data logger, existing racks, etc.) and the timing for installation/any training. For the purposes of costing, Wood should assume that RAPCA has a zero-air system and NPN/NO2 gas cylinders.

The contractor shall schedule a site visit for installation of the NO/NOy system. During the visit the contractor shall set up automated zero, span, and QC checks and remote access to review the data through the ESC Airvision data logger software. Dayton currently performs zero and span checks daily and QC checks weekly.

While on-site the contractor shall review any documentation, and recommend any updates reflecting changes in procedures or instrument operation

# 4. Data review and interim data report documentation

The contractor shall review data ambient, QC and housekeeping data remotely using CASTNET procedures outlined in the CASTNET QAPP v 9.1.

The contractor shall deliver a document to EPA with any findings and summarize data collected after 4-months of operation.

#### 5. Audit/Calibration visit.

The contractor shall perform an on-site calibration and audit of the instruments and subsystems (zero air generator, pumps, etc.) following the procedures in the CASTNET QAPP v9.1 Appendix 11, 3-5 months after the installation.

The contractor shall include costing for one additional repair trip. This trip will only occur if it is determined that troubleshooting or calibration cannot be performed remotely.

#### 6. Remote Troubleshooting

Wood shall provide RAPCA with remote troubleshooting if issues arise with the NO/NOy system. For costing purposes Wood shall estimate 20 hours of troubleshooting. Additional hours may be approved through technical direction if needed.

#### 7. Final Report

The contractor shall submit a concise final report with recommendations and findings. The report should summarize ambient NO/NOy data as well as QC checks and calibration results. The contractor shall include general comparisons with CASTNET-operated NO/NOy analyzers (i.e. differences in diurnal patterns, operation, failed QC checks, etc.).

# 8. Project Closeout:

If the project is successful as measured by high completeness of the NOy/NO data and QC checks consistently being within acceptable tolerances, then the project will continue for the full duration (ending July 8<sup>th</sup> 2019) and RAPCA will take over the measurements at the end of the project. If the project is not going well either due to low completeness of the NOy/NO data and/or due to poor performance of QC checks, then EPA will direct Wood to uninstall the equipment and ship back to either EPA in RTP, NC, or Teledyne API in San Diego CA. A decision to end the project early and have Wood uninstall the equipment or leave in place and continue will be made by March 8<sup>th</sup>, 2019.

# V. DELIVERABLES AND SCHEDULE

# 1. Proposal

The contractor shall deliver a Task Order Proposal in accordance with clause B.7 Task Order Ordering Procedures of the contract. The proposal shall be submitted 10 days after receipt of the SOW.

# 2. Monthly Progress Report

The contractor shall prepare and submit a monthly progress report by the 15<sup>th</sup> of each month summarizing the progress made, issues encountered or expected, work planned for the next reporting period and costs. These reports shall comply with contract clauses F.5 Reports of Work and F.1 Monthly Progress Report. Reports shall be delivered electronically.

# 3. Interim Data Report

The contractor shall prepare and submit an interim data report by February 18<sup>th</sup> 2019. The report shall concisely summarize the ambient NO/NOy data and QC results.

# 4. Final Report

The contractor shall prepare and submit a final report at the end of data collection summarizing any findings, recommendations, ambient data results and a comparison to data collected at NO/NOy CASTNET sites. A draft report shall be delivered by July 8<sup>th</sup> 2019.

#### **Distribution of Deliverables:**

Addressee	Copies
EPA Contracting Officer (Mike Fox)	1
EPA Project Officer (Melissa Puchalski)	1
EPA Alternate (Laurie Trinca)	1
EPA Technical Advisor (Tim Hanley)	1

Contract#: EP-W-16-015 Task Order#: 68HERH19F0001

Project#: 2015

# ATTACHMENT B SUMMARY OF TASK ORDER OBLIGATION/CEILING AMOUNTS

Total Funding/Obligation Amounts								
Period	Previous Amount	This Action	Amount					
Base Period	-	\$31,095.00	\$31,095.00					
Total		\$31,095.00	\$31,095.00					

	Total Task Order Ceiling								
Period	Previous Amount	This Action	Amount						
Base Period	-	\$32,708.00	\$32,708.00						
Total	-	\$32,708.00	\$32,708.00						

**Note:** This task order is incrementally funded in accordance with contract clause B.5 Limitation of Government's Obligation (EPA-B-32-103).

2. AMERICANT MODIFICATION NO. SETTECTIVE BATE A. REQUISITION/PURCH ASSERTED. NO. 2015  1. SIGNATURE OF COOK SETTED ASSERTED ASSER	AMENDMENT OF SOLICITATION/MODI	ICATION OF C	ONTRACT		1. CONTRACT ID CODE	F	PAGE OF PAGES		
RECOLD   R	2. AMENDMENT/MODIFICATION NO.	3. EFFECTIV	E DATE	4. F	 REQUISITION/PURCHASE REQ. NO.	5. PRO	JECT NO	2 . (If applicable)	
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WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.  Althr: JOSEPH FARRELL 751 Abov May  Blue Bell PA 194221972  ***  ***  ***  ***  ***  ***  ***	US Environmental Protection William Jefferson Clinton 1200 Pennsylvania Avenue, Mail Code: 3803R	Building							
WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC.  Afth: JOSEPH FARRELL  751 Abor Way  Six 180  Blue Bell PA 194221972    The draws numbered selectation is emended as set forth, inter the first of the		treet, county, State an	d ZIP Code)	(1)	9A. AMENDMENT OF SOLICITATION NO.				
11. THIS ITEM ONLY APPLIES TO AMERIOMENTS OF SOLICITATIONS  The above numbered solicitation is amended as an efforth in team. It is not evidented.  Offers must activovelege sceeping of this amended as an efforth in team of season of the following methods. (a) By completing leans B and 15. and returning  Leans	WOOD ENVIRONMENT & INFRASTRUCTURE SOLUTIONS, INC. Attn: JOSEPH FARRELL 751 Arbor Way Ste 180				9B. DATED (SEE ITEM 11)  10A. MODIFICATION OF CONTRACT/ORDER N EP-W-16-015 68HERH19F0001	О.			
The above numbered solicitation is amended as set forth in hom 14. The hour and date specified for receipt of Offers I is extended. The next settomeder receipt of this amendment prior to the hour and date specified in the solicitation and amendment or set to give completing thems 8 and 15, and returning  separate better or electric communication which has determined as the solicitation and amendment management or each copy of the submitted (r) (c) by separate better or electric communication which has determined by the separate better or electric communication which has been set to the solicitation and amendment management or the solicitation and amendment management management or the solicitation and amendment management management management or the solicitation and amendment management manageme	CODE 038086125	FACILITY COI	DE		10/03/2018				
Contract converses an expected in the amendment prior to the hour and date specified in the solicitation are a mended b, by one of the following methods (a) By completing thems a and 15, and refurning copies of the amendment (b) by advandwaging receipt of the amendment (c) by advandwaging receipt of the amendment (c) by advandwaging receipt of the present provided search and the provided receipt of the present provided receipt the provided receipt of the present provided receipt the provided receipt the provided receipt the provided receipt the provided received provided received provided received the provided received provided receiv		11. THIS IT	TEM ONLY APPLIES TO A	MEN	IDMENTS OF SOLICITATIONS				
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:  D. OTHER (Specify type of modification and authority)  X Mutual Agreement of the Parties  E. IMPORTANT: Contractor	separate letter or electronic communication which RECEIVED AT THE PLACE DESIGNATED FOR OFFER. If by virtue of this amendment you desire each letter or electronic communication makes re 12. ACCOUNTING AND APPROPRIATION DATA (If See Schedule	includes a reference to change an offer required)  O MODIFICATION (	ce to the solicitation and a DFFERS PRIOR TO THE already submitted, such tation and this amendmen	meno HOU char nt, an	dment numbers. FAILURE OF YOUR ACKNOWLIR AND DATE SPECIFIED MAY RESULT IN REJECTIVE may be made by letter or electronic communiced is received prior to the opening hour and date specified to the opening hour and date specified with the contractive of the contr	EDGEMI ECTION ( ation, pro pecified.	ENT TO B OF YOUR ovided	BE	
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14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)  DUNS Number: 038086125  The purpose of this modification is to extend the period of performance of this order by 30 days, at no additional cost to the government. The period of performance end date is being changed from July 8, 2019 to August 8, 2019.  TOCOR: Melissa Puchalski LIST OF CHANGES:  Reason for Modification: Supplemental Agreement for work within scope Period OF Performance End Date changed from 08-JUL-19 to 08-AUG-19  CHANGES FOR LINE ITEM NUMBER: 1  End Date changed from 08-JUL-19 to 08-AUG-19  Continued  Except as provided herein, all terms and conditions of the document referenced in Item 9 A or 10A, as heretofore changed, remains unchanged and in full force and effect.  15A. NAME AND TITLE OF SIGNER (Type or print)  Kemp Howell - Project Manager  16C. DATE SIGNED  16S. CONTRACTOR/OFFEOR  16S. CONTRACTOR/OFFEOR  16S. UNITED STATES OF AMERICA	78-077	0.400		d reti	copies to the lequin	a office			
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Except as provided herein, all terms and conditions of the document referenced in Item 9 A or 10A, as heretofore changed, remains unchanged and in full force and effect.  15A. NAME AND TITLE OF SIGNER (Type or print)    Michael C. Fox	The purpose of this modification days, at no additional cost changed from July 8, 2019 TOCOR: Melissa Puchalski LIST OF CHANGES: Reason for Modification: S Period Of Performance End CHANGES FOR LINE ITEM NUMB	t to the o to August upplementa Date chang ER: 1	government. T 8, 2019. al Agreement ged from 08-J	he fo	period of performance en			=	
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	US Environmental Protection Agency		1 1		
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	RTP-Finance Center (AA216-01)				
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	Period of Performance: 10/04/2018 to 08/08/2019				